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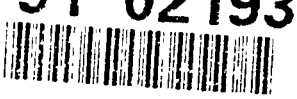
A RAND NOTE

Analytic War Plans: Adaptive Force-Employment Logic in the RAND Strategy Assessment System (RSAS)

William Schwabe, Barry Wilson

July 1990

RAND



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The RAND Strategy Assessment System (RSAS) simulates future USSR vs. U.S. armed conflict scenarios by playing Red and Blue Agent programs against each other. These Agents are each headed by a National Command Level, which gives guidance to subordinate Military Command Levels. The programs the latter execute are called Analytic War Plans (AWPs), which use conditional logic to adapt the force orders they issue. AWPs are written in the RAND-ABEL language. They have a hierarchy of functions. A phase is composed of several moves and usually lasts for more than a day. Procedures contain force order tables that issue orders to the various force models. Authorization for plans to take many important actions must be specifically granted through the Authorization variable. This Note describes the structure of AWPs and Control Plans in detail, and provides annotated examples of a Control Plan and two AWPs.

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Analytic War Plans: Adaptive Force-Employment Logic in the RAND Strategy Assessment System (RSAS)

William Schwabe, Barry Wilson

July 1990

Prepared for the
Director of Net Assessment,
Office of the Secretary of Defense

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RAND

PREFACE

The work described in this Note was sponsored by the Director of Net Assessment in the Office of the Secretary of Defense (OSD). It was conducted in the RAND Strategy Assessment Center (RSAC), which is part of RAND's National Defense Research Institute (NDRI), a federally funded research and development center sponsored by OSD.

Comments are welcome and should be addressed to the authors or to Dr. Paul Davis, Director of the RSAC.

SUMMARY

The **RAND Strategy Assessment System** (RSAS) simulates future USSR vs. U.S. armed conflict scenarios by playing **Red Agent** and **Blue Agent** programs against each other. Independent, political-military decisions of other countries are simulated by **Green Agent**. A set of integrated force simulation models, called **CAMPAIGN**, [1] keeps track of forces, executes orders from the Agent programs, and computes the outcomes of military operations. Military analysts can use a Control Agent program to replace or override Red, Blue, or Green Agents. Human players can observe, override, or replace the decision logic in the Agent programs. The Agent programs have alternative sets of decision rules, which analysts using the RSAS can control.

Red and Blue Agents are each headed by a **National Command Level**, which gives guidance to subordinate **Military Command Levels**. The programs that the Military Command Level models execute are called **Analytic War Plans** (AWPs). These have three functions:

- To provide adaptive force-employment orders as part of simulations.
- To provide templates and standard, modular procedures to be used by military planners and analysts as they construct and test concepts of operations based on alternative strategies.
- To provide an evolutionary knowledge base that can be used to communicate concepts and details thereof from one group of analysts/planners to another.

AWP programs use conditional logic to adapt the force orders they issue. This replaces the more familiar approach in actual military operations plans (OPLANs) and most simulations of having set, "scripted" orders. The use of unconditionally scripted orders for analysis is fundamentally flawed as a basis for analytic comparisons because, in fact, force employment *would* change if capabilities and scenario changed. For example, it is common to compare the effectiveness of U.S. defenses with and without weapon X, without considering whether an attacker would change *his* strategy if we had weapon X. AWPs can represent how strategies might be adapted.

[1] Also called Force Agent.

AWPs represent a rule-based method for building in sensible adaptations that move in the direction of optimization. True optimizations are of dubious relevance in much work because of their dependence on information the commanders would not have about forces, laws of war, and so forth.

Each different strategy for a Command or theater is represented by a different AWP. An alternative approach would be feasible, but RSAS developers opted for keeping plans relatively pure for the sake of clarity and familiarity. Although RAND has not had access to actual OPLANs in developing the RSAS AWPs, the AWPs are similar enough to OPLANs that JCS and CINC planners should be able to use their own versions of AWPs to represent and study strategies and concepts of operations.

AWPs are written in the **RAND-ABEL®** computer language. Individual plans are named with a number following the name of their command. Plans ending in the number 0 are peacetime plans that can be used to monitor the bounding conditions on the command.

AWP source code can be accessed through the RSAS background menu by pulling down the menus Abel-Rules/AWP, then either Blue or Red, and the name of the command. Files ending in ".A" contain RAND-ABEL code.

In addition to the Red, Blue, and Green Agents already mentioned, there is a **Control Agent**, which can act for the RSAS user in doing things the user would otherwise do interactively with the computer.[2] Control Agent has three modes of operation:

- **Scenario Generator** by which the user schedules interventions with the RSAS Data Editor, to pass instructions to other Agent programs at desired times.
- **Control Plan** by which the user schedules interventions in an interpreted RAND-ABEL plan, similar to an AWP, with moves, conditional logic, and orders. This maximizes flexibility and collects interventions in one place and is often used as a prototype for developing AWPs.
- **Order Function** by which the user inserts instructions for immediate execution.

---

[2]See Davis and Hall, 1988, pp. 58-65 for additional information on Control Agent.

In an Analytic War Plan, there is a hierarchy of functions. The highest level is the **concept of operations** for the campaign. This is divided into phases, which consist of moves, which evoke procedures, such as time-sequenced orders to forces.

A **phase** is composed of a number of moves and usually lasts for more than one day. Typically, RSAS plans have preparation or deterrence, conventional, nuclear, and termination phases. A **move** is composed of a number of procedures that are done at one time. A combat phase, for example, may have several reinforcement and air allocation moves. A procedure is composed of specific force order tables that accomplish a single purpose. Examples deploy U.S. forces in-place in AFCENT or order a limited nuclear strike in-theater. Phases and moves are specific to individual plans, and their names contain the name of the plan. Procedures are more general and can be used in any plan. In practice, procedures are sometimes performed directly from a phase.

Procedures contain force order tables that issue orders to the various force models of the RSAS. Procedures may be written for a particular AWP, in which case the first part of its name is the plan name, or they may be written as general procedures. If for a single plan, their on-line source code is in the file containing the plan's top-level, phase, and move functions; in this example, the file is Src/Blue/Awp/Afcent/afcent1.A. The general procedures are in file library.A for the appropriate command, such as Src/Blue/Awp/Afcent/library.A.

The plan, phase, and move functions are in files bearing the AWP's name. Procedures or orders unique to a plan are included in the plan file also; other procedures, which may be used by more than one plan, are in library files. Plans and library procedures for a given command, such as AFCENT, are in directories bearing the command's name. All such command directories are in a directory named for an agent, such as Blue. The Blue and Red plan directories are in a directory named AWP, which is in the Src (source) directory, which houses all RSAS RAND-ABEL source code.

Authorization for plans to take many important actions must be specifically granted through the Authorization variable. Authorization comes from the National Command Level models, the user, a control plan, or the scenario generator. The JCS or SHC coordinating plans can set some authorizations if those plans are authorized to do so.

Preplanned **communications** up the Red or Blue chain of command are represented by the function Notify-higher-authority, which passes on a reason and recommendation.

In addition to preplanned communications represented by notifications, AWPs notify higher authority of violation of active **bounds.** Bounds can be thought of as conditions that, if arising, might prompt the NCL to reconsider strategy or guidance.

In the Automated mode of running the Blue and Red Agents, the NCL models (Sams and Ivans) do not specify the specific AWPs to run in each command, but instead specify the desired escalation level, objectives, and strategies (as well as the control variables mentioned previously). From these guidances, the Global Command Level AWPs (JCS and SHC) choose the best fitting plan.

Escalation-guidance specifies for each command the level of hostilities, and implicitly the weapons to use, in order to achieve its objective.

Analytic war plans issue orders to the RSAS force models through RAND-ABEL **order tables.** The JCS and SHC war plans communicate to Green Agent through Cable and Announcement functions that give desired third-country postures. All plans also communicate with their superior plans in the command hierarchy through the Notify-higher-authority function, giving the reason for the communication and a recommendation for action. Communication downward is through authorizations and other controls.

A **log** tracing the execution of the Red and Blue Agents is available through the background menu. Log statements in the analytic war plans write execution information into the game log at three levels of detail: decisions only, decisions and reasons, and decisions, reasons, and notes. Log information can be viewed during or after the game at any level up to the level written.

Control plans are standardized interpreted functions allowing the analyst to schedule interventions such as parameter changes or orders to forces on the basis of time or condition in the simulation.[3] For example, the baseline AWP might not employ certain units explicitly, leaving their employment to be determined by a general force-allocator program called the Ground Commander Model embedded in Campaign-MT. A control plan, however, might specify that, in addition to all the orders coming from the

[3]Control plans are part of the larger "analyst plan," which is the interpreted files collecting the analyst's special instructions or modifications for the particular run or set of runs in question. Typically, they will include a number of statements establishing values for combat-model parameters and specifying such administrative matters as log level, the displays to be automatically reported into the log, and game duration. They may also contain statements changing decision-model parameters for Green, Red, or Blue. And they may contain modified versions of functions appearing in any of the RAND-ABEL models used in the simulation. These modified versions will then be used interpretively instead of the compiled versions during the run.

baseline plan, specific orders should be sent to these particular units at specified times or events.

Control plans can represent the analyst by changing the laws of war or inserting exogenous events, can represent and supplement AWPs by issuing orders to forces, and can play the NCL by picking AWPs and setting AWP guidance. Often a control plan is a mix of the three.[4] In the role of AWPs, control plans have often been used in the AWP development process to test in the interpreter the orders of a planned AWP before building its more complex structure.

One control plan exists for each of the Blue, Red, Green, and Force Agents. All are run by Control Agent. Default copies of these control plans can be found in the file Rsas/Run/INT/Hide/analyst-plan.A, along with documentation and examples.

RAND-ABEL is relatively easy to read. Here is an example of a function containing log statements, order tables, and some conditional logic. Although one would want to know definitions for some of the terms, readers with a general military background will be able to make sense of most of it:

```
Define AFCENT1-forward-defense-order:

    Log-decision "     Ordering dispersal of air forces".

    Table Disperse-order
      unit   owner  in-region     %-dispersal
      ====   =====  ==========    ===========
      Air    all    FRG           5
      Air    all    Belgium       5
      Air    all    Netherlands   5
      Air    all    Denmark       5
      Air    all    UK            5
[End Table].

    If Today < C-Day of AFCENT + 1
    Then
    {
    Log-decision "     NORTHAG delaying vice defending".
    Log-note     "     CENTAG axis mission Defend".
```

[4]If a control plan is used to define a scenario through AWP selection and controls, it is a good idea to avoid also using the scenario generator, through the Data Editor or through application of a delta WSDS. Both use some of the same mechanisms and can easily step on each other's efforts.

```
    Table Axis-mission-order
      axis      mission        start-kms   end-kms
      ======    ===========    =========   =======.
      CEUR-2    Defend-delay   0           159
      CEUR-3    Defend-delay   0           126
      CEUR-4    Defend-delay   0           149
      CEUR-5    Defend-delay   0            96
      CEUR-6    Defend-delay   0            40
    [End Table]
    )
End [AFCENT1-forward-defense-order].
```

AWPs make extensive use of RAND-ABEL **decision tables**, in which columns of conditional (input) variables appear to the left of a solidus (/) and one or more columns of actions (outputs) appear to the right. These decision tables are logically equivalent to sets of if-then-else rules in which the conditions on each row are checked against the current situational data base. If they match the current situation, the output action is taken and the remaining rows are not executed; otherwise, each row is checked in turn, until a match is or is not found. In this example, the conditions of NATO cohesion and prescribed strategy (known to the program) are used to determine a plan for AFCENT. If no match is otherwise found (the -- means "any"), the peacetime plan is selected:

```
Decision Table
  nato-
  cohesion   strategy    / AFCENT-plan
  ========   ==========  / ================================.
   Cohesive  Forward       AFCENT1      [Forward Def]
   Cohesive  Fallback      AFCENT2      [Fallback Def]
  <Cohesive  --            AFCENT3      [Incohesive Alliance]
   --        Prompt-nuc    AFCENT4      [Prompt Nuclear Def]
   --        --            AFCENT0      [Peacetime Plan]
```

AWPs and Control Plans contain many orders written as RAND-ABEL force order tables. These tables are executable RAND-ABEL code and must be correctly formatted.

The RAND-ABEL force order tables are actually calls to lower-level utility functions which translate the table entries into CAMPAIGN, Referee, and Flag model orders.

Notifications are the message mechanism by which commands within Red and Blue Agents report to their superior commands. Thus a notification from an AFCENT analytic war plan would be received by the EUR plan and, if sent further, would be

received by the JCS plan, and finally the NCA. This communication is one-way, from lower commands to higher.[5]

Cables are the message mechanism by which the GCLs of Red and Blue Agents communicate their requests for changes in political postures, basing privileges, and control of forces. This communication is one-way from Red or Blue Agent to a third country, and may be delayed depending on the political and military situation in the receiving country.

Hotlines are the message mechanism by which the GCLs of Red and Blue agents may communicate. The message below means "If you Do-not-escalate, then I Will-not-escalate, else I will escalate to Eur-demo-tac-nuc at day 10, 0 hour."

```
Table Hotline
  request          reward             penalty           deadline
  ===============  =================  ================  =========.
  Do-not-escalate  Will-not-escalate  Eur-demo-tac-nuc  (10 * 24).
```

Announcements are the message mechanism by which the GCLs of Red and Blue agents and third countries modeled by Green Agent communicate "If-then-else" messages. The message below means "From FRG To-Blue: If you Provide-nuc-defense, then I will do nothing (--), else I will Cease-fire at day 10, 0 hour."

```
Table  Announce
  country channel action               reward penalty    deadline
  ======= ======= ==================== ====== ========== =========.
  FRG     To-Blue Provide-nuc-defense  --     Cease-fire (10 * 24).
```

Force **queries** are RAND-ABEL functions that report a data value about the state of the world from the force models. Force queries begin, with a few exceptions, with the words "Ask-force."

The **Flag Model** is a RAND-ABEL force model available to the Red and Blue agents. Using a simple set of arrays, it keeps track of the status of a set of actions by region and actor. When one of the list of actions is ordered, a flag is raised (or single value set) to indicate that the action is taking place. No detailed modeling takes place. The RSAS decision agents often use this mechanism to indicate actions for which no detailed force model exists, or is even possible. Some of these actions cover capabilities of other force models. Actions such as Conventional-combat are only modeled by

[5]Higher commands communicate to their subordinates by issuing authorizations, other guidance, and force orders.

CAMPAIGN in certain regions of the world. The Flag Model allows these actions to be captured worldwide.

Enumerations are ordered sets of values, whose names, by RAND convention, include the prefix "Type." Rule writers need to know the declared values of enumerations to test on them in If-Then statements.

The body of this Note describes the structure of Analytic War Plans and Control Plans in detail. It provides annotated examples of a Control Plan and two Analytic War Plans--one a forward defense plan for NATO's Central Region and the other a global coordination plan for the JCS. Reference Sections give formats for all RAND-ABEL order tables, lists of predefined variables and their allowed values, formats for queries to Force simulation models, and more.

A considerable body of work has already been accomplished, but much more remains to be done. Currently, AWPs are available for the major theaters, but there is considerable need and potential for representation of additional strategies and extension and refinement of those already modeled.

ACKNOWLEDGMENTS

Paul Davis introduced the idea of analytic war plans into the RSAS and has made many contributions since then.

The first AWPs were written by William Jones with assistance from David Stein and Mark LaCasse. Subsequently, many improvements have been made by David Shlapak, Robert Howe, John Schrader, Bruce Pirnie, Bruce Bennett, Patrick Allen, Loretta Verma, and Richard Wise.

The description of queries in Section VIII of this Note draws heavily from on-line documentation written by Robert Weissler.

The manuscript was typed by Linda Quicker, Millie Zucker, and Eleanor Haggerty. Janet DeLand helped with formatting.

Dan Fox and John Schrader reviewed earlier drafts and made many helpful comments.

Finally, Marie Schwabe inspired a careful rethinking of this material after she dragged all of Daddy's Macintosh icons into Trash.

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I. INTRODUCTION

BACKGROUND

Red and Blue Agents

The RAND Strategy Assessment System (RSAS) simulates future USSR vs. U.S. armed conflict scenarios by playing Red Agent and Blue Agent programs against each other. Independent, political-military decisions of other countries are simulated by Green Agent. A set of integrated force simulation models called CAMPAIGN [1] keep track of forces, execute orders from the Agent programs, and compute the outcomes of military operations. Military analysts can use a Control Agent program to replace or override Red, Blue, or Green Agents. Human players can observe, override, or replace the decision logic in the Agent programs. The Agent programs have alternative sets of decision rules, which analysts using the RSAS can control. Figure 1 depicts this architecture.

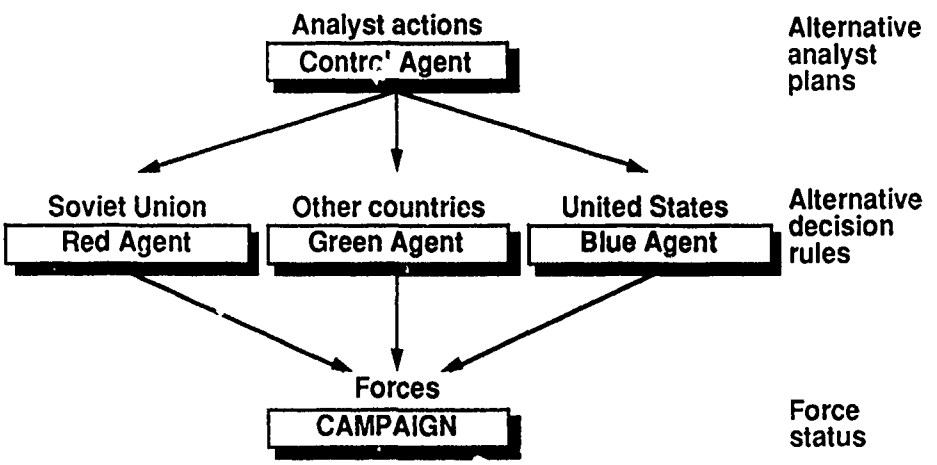

Fig. 1--RSAS architecture

[1] Also called Force Agent.

As shown in Fig. 2, Red and Blue Agents are headed by National Command Level (NCL)[2] programs, which simulate political-military decisionmaking. The guidance output from the NCL is input to Military Command Level (MCL) programs. The Red MCLs correspond to the Supreme High Command (the Russian abbreviation is VGK) and subordinate High Commands for theater (the Russian abbreviation for a theater is TVD) Commands. On the Blue side the MCLs correspond to the Joint Chiefs of Staff (JCS), coordinating theater Commands (such as SACEUR and USCINCPAC), and individual theater Commands (such as AFCENT, CENTCOM, and SAC). The Command structure can be changed, but the standard organizations for Red and Blue Agent military are as shown in Figs. 3 and 4, respectively.

Functions of Military Command Level Models

The programs that the Military Command Level models execute are called Analytic War Plans (AWPs). These have three functions:

- To provide adaptive force-employment orders as part of simulations.
- To provide templates and standard, modular procedures to be used by military planners and analysts as they construct and test concepts of operations based on alternative strategies. The templates improve comprehensiveness and clarity; the modular procedures save time and improve consistency and clarity.

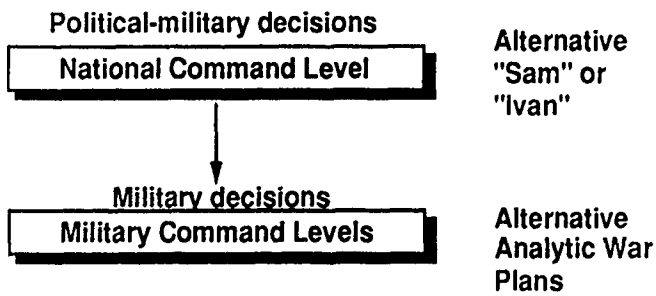

Fig. 2--Red and Blue Agent architecture

[2]To avoid possible confusion between two meanings of "command," which can mean an entity in a military organization or an order to subordinates, we use "Command" for the organizational entity and "order" for the directive.

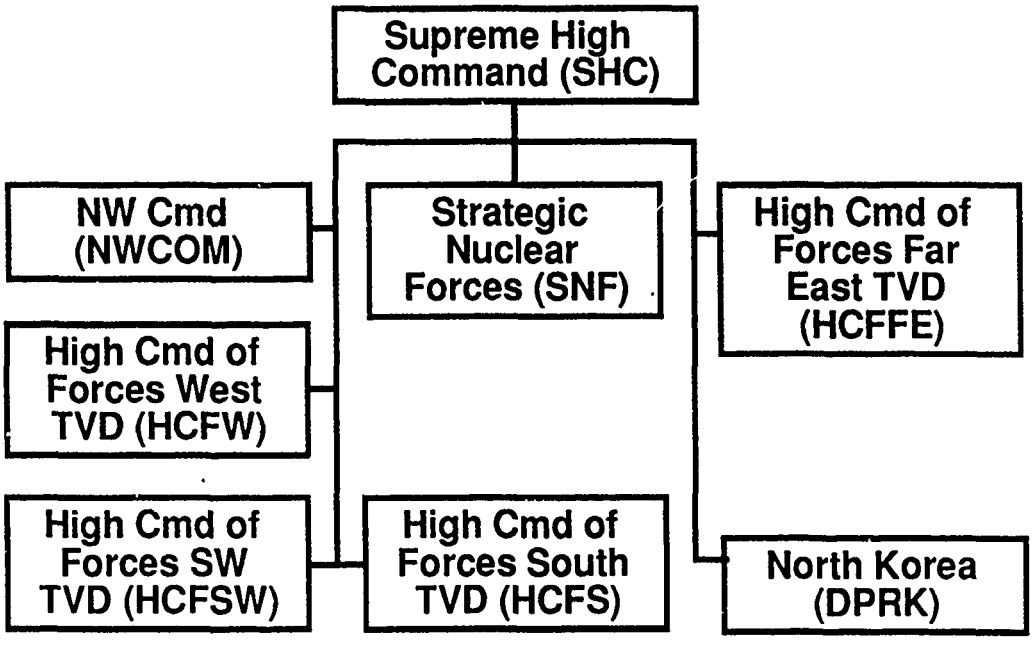

Fig. 3--Red Agent command organization

- To provide an evolutionary knowledge base that can be used to communicate concepts and details thereof from one group of analysts/planners to another. That is, these models are inherently reusable, within the RSAS environment.

Technological Significance

AWP programs use conditional logic to adapt the force orders they issue. This replaces the more familiar approach in actual military operations plans (OPLANs) and most simulations of having set, "scripted" orders. The use of unconditionally scripted orders for analysis is fundamentally flawed as a basis for analytic comparisons because, in fact, force employment *would* change if capabilities and scenario changed. For example, it is common to compare the effectiveness of U.S. defenses with and without weapon X, without considering whether an attacker would change *his* strategy if we had weapon X. AWPs can represent how strategies might be adapted.

AWPs represent a rule-based method for building in sensible adaptations that move in the direction of optimization. True optimizations are of dubious relevance in

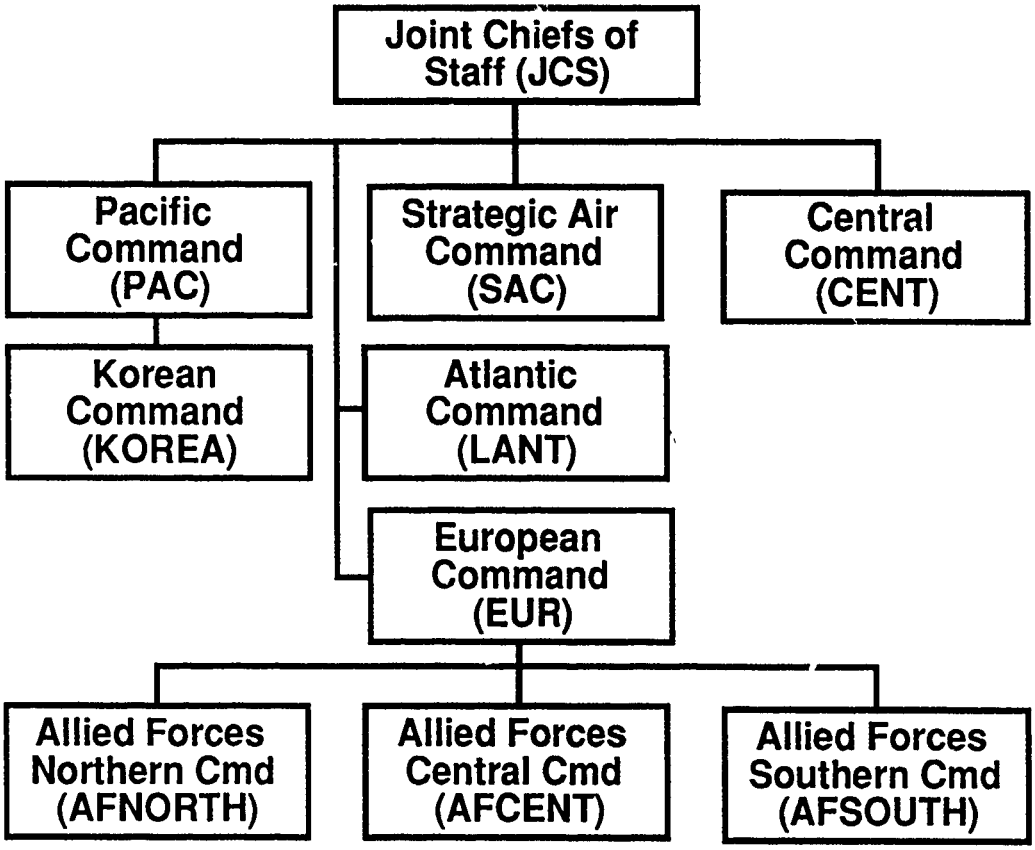

Fig. 4 --Blue Agent command organization

much work because of their dependence on information the commanders would not have about forces, laws of war, and so forth.

AWPs represent a highly sophisticated application of artificial intelligence (AI) techniques that has been turned into something down-to-earth and comfortable, rather than something esoteric and mysterious.

Concepts Behind Analytic War Plans

An analytic war plan is a representation for analytic purposes of a war plan in a form suitable for execution by the RSAS Red or Blue Agent. Analytic war plans are intended to be credible surrogates not only for real war plans but also for the plan adjustments made by military commanders in the course of a campaign.

There is meant to be approximate verisimilitude between the RSAS Agent Command structure and that of the Soviet Union and the United States; however, there are some composite Commands in RSAS. For example, the Transportation Command (TRANSCOM) is implicitly within RSAS's JCS, and the Pacific Fleet Command (CINCPACFLT) is within PAC. These could be broken out separately, if needed.

Distinctions have not explicitly been drawn between combined Commands, such as SACEUR or Combined Forces Command, and their U.S. components, such as USCINCEUR and U.S. Forces Korea. Additionally, because RSAS is more a tool for modeling strategies than organizations, a single Analytic War Plan representing a strategy must be executed by a single Military Command. For example, RSAS representations of a strategic nuclear Single Integrated Operations Plan (SIOP) must be executed by a single MCL (here, SAC), despite the fact it would be executed by several real-world Commands (SAC, LANTCOM, and PACOM). These and other RSAS vs. real-world distinctions are summarized in Tables 1 and 2.

Table 1

COMPARISON OF RED AGENT WITH SOVIET UNION/ALLIES

Red Agent Command	Corresponding Soviet Union/ Allied Command	Comment
SHC	Soviet Supreme High Command Warsaw Pact High Command	Red agent SHC controls allied forces only if authorized by Green agent
NWCOM	Northwest Command Northern Fleet Command	
HCFW	Western TVD Command Baltic Fleet Command	
HCFSW	Southwestern TVD Command Black Sea Fleet Command	
HCFS	Southern TVD Command	
SNF	Strategic Nuclear Forces Rear TVD Command	SNF is treated as an intercontinental and homeland command
HCFFE	Far Eastern TVD Command Pacific Ocean Fleet Command	
DPRK	Democratic People's Republic of Korea (North Korea)	DPRK is treated as a military command under Green agent's North Korea

Each different strategy for a Command or theater is represented by a different AWP. An alternative approach would be feasible, but RSAS developers opted for keeping plans relatively pure for the sake of clarity and familiarity. Although RAND has not had access to actual OPLANs in developing the RSAS AWPs, the AWPs are similar enough to OPLANs that JCS and CINC planners should be able to use their own versions of AWPs to represent and study strategies and concepts of operations.

Because analytic war plans are inspired by military operation plans (OPLANs) and operation orders (OPORDs), it may be helpful to quote the official U.S. definitions of these:

Table 2

COMPARISON OF BLUE AGENT WITH UNITED STATES/ALLIES

Blue Agent Command	Corresponding United States/ Allied Command	Comment
JCS	Joint Chiefs of Staff State Department	Blue agent JCS controls allied forces only if authorized by Green agent
EUR	SACEUR USCINCEUR	
AFNORTH	AFNORTH	
AFCENT	AFCENT	
AFSOUTH	AFSOUTH US Sixth Fleet	
LANT	USLANTCOM	
PAC	USPACOM	
SAC	SAC NORAD	SAC is treated an an intercontinental and homeland command
KOREA	Combined Forces Command, Korea	Subordinate to PAC

1. [An operation plan is a] plan for a single or series of connected operations to be carried out simultaneously or in succession. It is usually based upon stated assumptions and is the form of directive employed by higher authority to permit subordinate commanders to prepare supporting plans and orders.

2. The designation "plan" is usually used instead of "order" in preparing for operations well in advance. An operation plan may be put into effect at a prescribed time, or on signal, and then becomes the operation order.

3. [An operation order is a] directive. usually formal, issued by a commander to subordinate commanders for the purpose of effecting the coordinated execution of an operation.[3]

The RSAS does not make formal distinctions between OPLANs and OPORDs. However, to some extent, a full analytic war plan, including rules for dealing with several possible contingencies, can be likened to an operation plan, and the specific path through a plan's logic taken during execution can be likened to an operation order.

Actual war plans familiar to U.S. military audiences are highly structured documents, often containing a considerable amount of redundant boilerplate, a rather linear concept of operations with relatively few, if any, contingency options, and detailed

[3]The Joint Chiefs of Staff, *Dictionary of Military and Associated Terms*, JCS Pub. 1, June 1979, p. 246.

tables of organization, communications, deployments, targeting, etc. They tend to be relatively strong on the early phases of a campaign and relatively weak on later stages, such as falling back, reconstituting, counterattacking, and terminating hostilities. They may be well integrated at the CINC level and below, but few are integrated CINC-to-CINC.

By comparison, AWPs also are highly structured, contain redundant boilerplate, are linear but allow for considerable conditional branching, and contain many detailed tables of orders. The structure is not the OPLAN's nesting by operational function of "body-annex-appendix-tab" but is a time- and triggering-event-based hierarchy of plan-phase-move-orders, as depicted in Fig. 5. An OPLAN's concept of operations may include a phase structure, but, unlike an AWP, it is not the basic organizing principle of the plan. The boilerplate in OPLANs meets bureaucratic requirements, such as citing references; in AWPs it meets computer system requirements, such as declaring variable names. OPLANs are meant to coordinate the efforts of thousands of people; the more linear they are, the better their chance of being executed as intended. AWPs, being computer programs, have no difficulty with conditional logic covering what to do if baseline assumptions prove incorrect. AWP order tables are similar to those in CINC-level OPLANs.

One of the difficulties--and benefits--in developing and using AWPs in the RSAS is that they must be comprehensive, describing a campaign strategy from beginning to end robustly enough to deal with major uncertainties in enemy behavior.

The RSAS distinguishes between AWPs that do or do not have subordinate command level plans running under them. Those that do have subordinate command levels must perform a coordinating function; hence, we refer to them as coordinating plans. The coordination includes response to redirection from above (such as occurs when the national command level "switches" plans), response to communications received from other countries, and response to reports from subordinates. All the plans are largely cybernetic in nature; that is, they function by making adjustments within limits set by higher authority.[4]

Plans at the lowest level in the Red or Blue Agent command organization do not have to coordinate subordinate analytic war plans. We refer to these as campaign plans.

---

[4]As an example, an AWP for defense in NATO's Central Region must specify how Blue uses operational reserves over time. It may do this by specifying use of a lower-level model called the Ground Commander Model (GCM), which follows logic such as reinforcing failure with weighting factors for different Corps sectors.

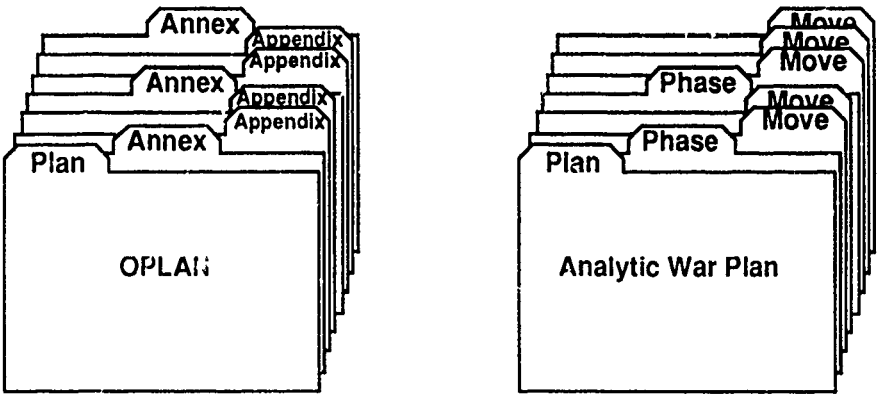

Fig. 5 --Structure of OPLANs and AWPs

A campaign is typically divided into phases that are subdivided into moves. Execution proceeds from the beginning to ending phase, unless aborted by higher authority. A campaign plan issues orders, waits until time or circumstances for the next action, then picks up where it left off.

AWP Files

AWPs are written in the RAND-ABEL® computer language, developed from C for use in RSAS decision models. The source code for each AWP is in a separate file. Individual plans are named with a number following the name of their command. Plans ending in the number 0 are peacetime plans that can be used to monitor the bounding conditions on the command. Bounds are discussed in Section II. Tables 3 and 4 list the Blue and Red AWPs currently provided with RSAS.

AWP source code can be accessed through the RSAS background menu by pulling down the menus Abel-Rules/AWP, then either Blue or Red, and the name of the command. Files ending in ".A" contain RAND-ABEL code. The actual directory structure, as shown in Fig. 6, is the same as that of the walking menus. Code for AWPs can be found in the appropriate command directory. "Dict" directories contain files of data dictionary declarations for variables, enumerations (types), and functions. Dictionary files end in ".D." The Utility directory contains utility functions pertaining to the mechanics of AWP operation. The Make directory contains the compiled AWP object code and the files that create it.

Table 3

BLUE AGENT ANALYTIC WAR PLANS

AWP	Description
Plans ending with zero	Peacetime plans reporting bound violations
JCS1	Regional or global conflict
EUR1	Defense of Western Europe
SAC1	Strategic nuclear strike
AFNORTH1	Defense of the Northern Region
AFCENT1	Forward defense of the Central Region
AFCENT2	Forward defense of the Central Region, fallback allowed
AFCENT3	Forward defense of the Central Region with an incohesive alliance
AFCENT4	Forward defense of the Central Region with nuclear use authorized
AFSOUTH1	Defense of the Southern Region
AFSOUTH2	Strategic leverage on Central Europe
CENT1	Limited deployment to the Persian Gulf
CENT2	Forward defense of Iran
LANT1	Defense of the Atlantic
PAC1	Defense of the Pacific
KOREA1	Defense of South Korea

On-line documentation about AWPs can be found in the following places, most easily reached with the walking menus available with an RSAS background open:

- Src/AWP/README file describes the latest on the directory structure and files within.
- Afcent and Hcfw code files each contain an extensive strategy discussion at the beginning. Other AWP files have lists of forces used but little strategy documentation.
- Doc/Software/MCL also contains documentation for some individual AWPs.
- Dictionary files in Dict directories contain documentation on most variables and enumerations, following the declaration of each element.

Other files of interest:

- Src/Interface/to-Force-C/Dict/type.D. Enumerations of names used in orders to CAMPAIGN.
- Src/Interface/to-Force-C/Dict/order-func.D. Declarations of order tables to CAMPAIGN.

Table 4

RED AGENT ANALYTIC WAR PLANS

AWP	Description
Plans ending with zero	Peacetime plans reporting bound violations
SHC1	Regional or global conflict
SNF1	Strategic nuclear strike
NWCOM1	Attack against Norway
HCFW1	Short-warning attack against FRG
HCFW2	Short-warning attack against FRG with premobilization
HCFW3	Variable mobilization attack against FRG
HCFW4	Full mobilization attack against FRG
HCFW5	Short-warning attack against FRG, respect Austrian neutrality
HCFW6	Short-warning attack against FRG with premobilization, withhold
HCFW7	Variable-mobilization attack against FRG, respect Austrian neutrality
HCFW8	Full mobilization attack against FRG, respect Austrian neutrality
HCFW9	Full mobilization attack against FRG with alliance problems
HCFW10	Full mobilization attack against FRG with alliance problems, respect Austrian neutrality
HCFSW1	Attack against NATO Southern Region
HCFSW2	Attack against the Balkans
HCFS1	Limited invasion of Iran
HCFS2	Full-scale invasion of Iran
HCFFE1	Attack in the Pacific
DPRK1	Attack against the ROK

- Src/Force-A/Referee/Dict/type.D. Enumerations of names used in orders to Referee.
- Src/Interface/to-Force-A/referee.D. Declarations of order tables to Referee.
- Src/NCL/Blue/Dictionary/Interface-variables.D. Declarations of NCL control variables for AWPs (also NCL/Red).
- Src/NCL/Blue/Dictionary/Interface-types.D. Enumerations for NCL control variables for AWPs (also NCL/Red).

Control Plans

In addition to the Red, Blue, and Green Agents already mentioned, there is a Control Agent, which can act for the RSAS user in doing things the user would otherwise do interactively with the computer.[5] Control Agent has three modes of operation:

[5]See Davis and Hall, 1988, pp. 58-65 for additional information on Control Agent.

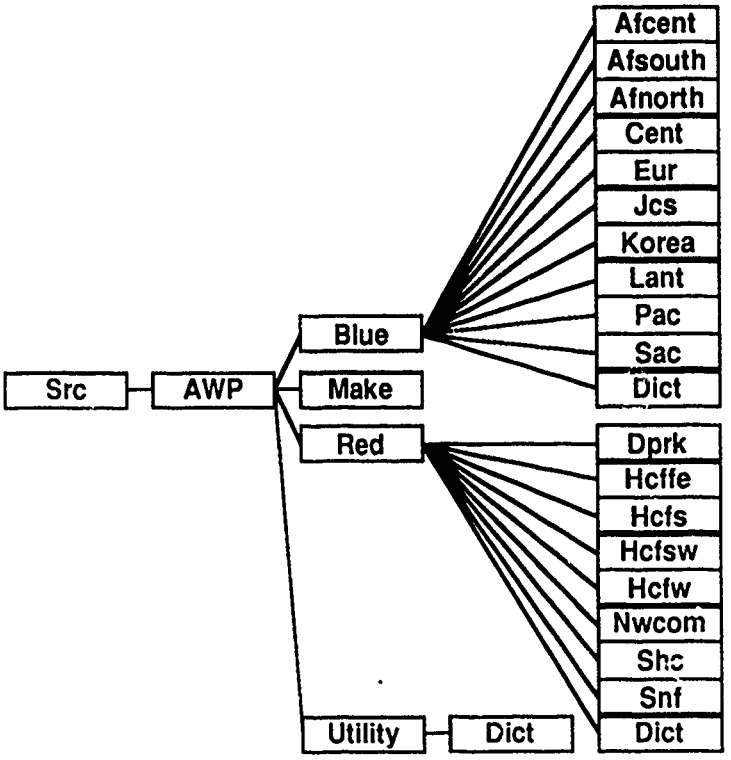

Fig. 6--AWP directory and file structure

- **Scenario Generator** by which the user schedules interventions with the RSAS Data Editor. These interventions pass instructions to other Agent programs at desired times.
- **Control Plan** by which the user schedules interventions in an interpreted RAND-ABEL plan, similar to an AWP, with moves, conditional logic, and orders. This maximizes flexibility and collects interventions in one place and is often used as a prototype for developing AWPs.
- **Order Function** by which the user inserts instructions for immediate execution.

Here, we are concerned only with Control Plans. The major differences between AWPs and Control Plans are shown in Table 5.

A Control Plan can serve in lieu of an Analytic War Plan; however, it can also supplement portions of one or more AWPs, or it could govern switching from one AWP to another.

WRITING AND MODIFYING ANALYTIC WAR PLANS[6]

AWPs can be written in a top-down or bottom-up fashion. The top-down approach for writing a campaign plan involves specifying its phase structure, making assumptions about enemy, own, and allied forces, formulating a concept of operations for each phase, and developing a sequence of orders to forces. It is often convenient to begin by copying an existing AWP that resembles the new one. Calls to perform existing procedures in the library (library.A functions) can speed the early stages of the process; the Table of Contents and Index to this Note should prove useful in helping users find

Table 5

COMPARISON OF ANALYTIC WAR PLANS AND CONTROL PLANS

Characteristic	Analytic War Plan	Control plan
Programming language	RAND-ABEL	RAND-ABEL
Type of program	Usually compiled, but all or portions can be interpreted	Usually interpreted
Structure	Nested hierarchy of functions: plan, phase, move	Single function with a series of moves controlled by if-then statements
Command levels represented	Separate AWPs for global command, supertheater command, and area command levels	One CP per side (Red, Blue, or Green)
Used to call library procedures	Yes	Yes

library procedures they need. The substance of library procedures is most readily examined on-line via selection from pull-down walking menus. Procedures requiring tailoring can be copied into files in the Rsas/Run/INT directory; it may be convenient to put these in red.A and blue.A files. Any changes or new RAND-ABEL rules must be debugged; this is most readily done in the interpreted mode (with files in the Rsas/Run/INT directory) via the pull-down menu item "Interpret now." This should be done before attempting to run the AWP. If there are errors in the RAND-ABEL code, there will be indications in the scrolling field beneath the RSAS Control Panel (upper left portion of the screen), which also makes reference to a log giving fuller information on

[6]This subsection is a quick overview of a complex subject. Readers unfamiliar with Force (CAMPAIGN) and other RSAS terminology should disregard the undefined jargon and skim this material for general meaning. RSAS users actually writing or modifying AWPs should consult the classified literature for detailed examples and procedures. Authors include Robert Howe, John Schrader, and William Schwabe.

errors. After successful interpreting, the AWP can be run, using the "Run game" button on the Control Panel. To verify desired results, the user should closely monitor execution-time logs, which can be displayed on screen, Force displays, which are accessible by stopping the run and mousing on the Control Panel's "Force" button, and by examining post-run logs and graphics.

The process is iterative: write, run, verify, rewrite .... It can take a matter of days or weeks.

After an AWP is running reasonably well in generating a linear, baseline sequence of events, it is often desirable to augment it with conditional logic to cover different exigencies, such as relationships between M-, C-, and D-day timing, various force ratios, and differing authorizations or constraints from higher authority. It is often helpful to involve a group of analysts in this process. RAND commonly does this through brainstorming sessions during which decision trees and tables are laid out on a blackboard. Another technique is to conduct one-on-one structured interviews with specialists. It is also possible to send hardcopy of new rules out for people to review, but this works only if the reviewers understand the substantive issues involved, have sufficient familiarity with RSAS and AWPs, and are motivated.

The bottom-up approach begins with interactive use of Force models, often called "sandtabling." This can be done either in the full-system environment or in the Force-only (Camper) environment. Either way, the analyst inputs force orders (typing them in the Force window or mousing on CMENT buttons), advancing game time, and examining Force displays of the results. This is greatly facilitated by use of ".com" files output by Force; these can be edited on-line and input again, via the Force "use" command. In this manner, the user analyst builds up an extensive .com file of Force orders observed to produce desired outcomes.

When the .com file has reached an adequate state of development (a matter of analyst judgment), it can be edited into separate Red and Blue control plans or into AWPs and supporting library procedure functions. The RAND-ABEL Send-force-order is especially useful here, as it uses strings directly extractable from the .com file. Later, the Send-force-order tables can be translated into RAND-ABEL Assign, Alert, Deploy, and other order tables, as described later in this Note.

OVERVIEW OF THE NOTE

Following this Introduction, Section II explains the basic structure of control plans and analytic war plans.

Sections III through V give detailed examples of a Red control plan and two analytic war plans: AFCENT1, a theater campaign plan for the forward defense of NATO's central region; and JCS1, a global coordination plan for conflicts beginning outside Europe.

The remainder of the Note contains reference material for users interested in modifying plans or seeking better understanding of the present plans. It includes formats for all RAND-ABEL force orders, formats for all intra- and inter-agent communications, formats for all queries to Force, the list of flag variables (situational variables set by heuristic rules or by fiat rather than by process models), and information on the current library of Red and Blue procedures.

An Appendix provides a short introduction to the RAND-ABEL programming language, developed by RAND for the RSAS. RAND-ABEL is available for non-RSAS uses as part of the RAMP (RAND-ABEL Modeling Platform).

The Note ends with a Bibliography and an Index.

II. STRUCTURE

AWP STRUCTURE

Here we explain how AWPs work, describing their general structure and giving examples drawn from an existing plan. Readers not familiar with the RAND-ABEL language may want to read the Appendix before this section.

In an OPLAN, the concept of operations is one annex among several; others may include task organization, communications, coordinating instructions, etc. There is a hierarchy of functions, with appendices to the annexes, and tabs to the appendices. In an Analytic War Plan, there is also a hierarchy of functions, but the highest level is the concept of operations for the campaign. This is divided into phases, which consist of moves, which evoke procedures, such as time-sequenced orders to forces.

A phase is composed of a number of moves and usually lasts for more than one day. Typically, RSAS plans have preparation or deterrence, conventional, nuclear, and termination phases. A move is composed of a number of procedures that are done at one time. A combat phase, for example, may have several reinforcement and air allocation moves. A procedure is composed of specific force order tables that accomplish a single purpose. Examples deploy U.S. forces in-place in AFCENT or order a limited nuclear strike in-theater. Phases and moves are specific to individual plans; their names contain the name of the plan. Procedures are more general and can be used in any plan. In practice, procedures are sometimes performed directly from a phase.

The plan, phase, and move functions are in files bearing the AWP's name. Procedures or orders unique to a plan are included in the plan file also; other procedures, which may be used by more than one plan, are in library files. Plans and library procedures for a given command, such as AFCENT, are in directories bearing the command's name. All such command directories are in a directory named for an agent, such as Blue. The Blue and Red plan directories are in a directory named AWP, which is in the Src (source) directory, which houses all RSAS RAND-ABEL source code.

Top-level Plan Function

The first function in each plan is referred to as the "top-level" plan function. It identifies and performs the phases of the plan.

All AWPs must begin with Sleep-and-wake-immediately. This is a technical function which temporarily stops execution of the plan. This allows all plans to be started before any enter their first phase. Figure 7 is a complete top-level function.

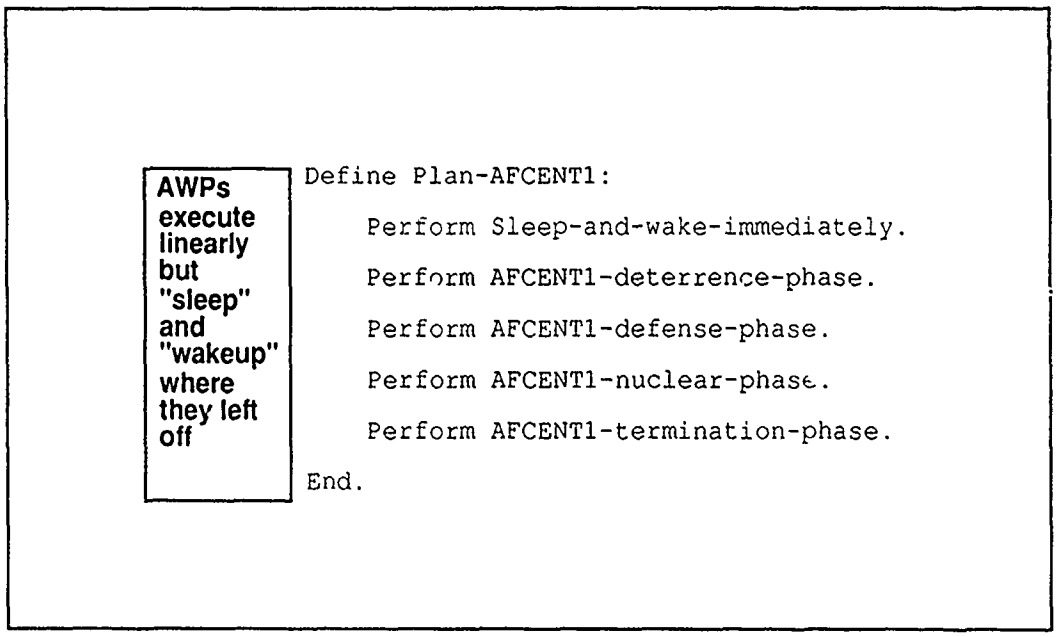

Fig. 7--Structure of top-level function in RAND-ABEL analytic war plan

Phase Function

The general structure for a phase has an initial move that performs orders to be done on entry into the phase, and a loop in which the plan moves once each day for the duration of the phase. In this daily-repeated section other moves are performed as the conditions for them arise. A phase function is shown in Fig. 8.

The variable Point-in-plan controls the phase of the plan. Because the RSAS allows plans to be switched during a game, knowledge of the current phase of each plan must be maintained so that a substituted plan can start execution in the correct phase. If, for instance, a Blue plan for a fallback-defense in Central Europe was substituted after D-day for a forward-defense plan, the new plan must begin in the proper phase. The variable Point-in-plan can take on the values of the enumeration Type-plan-point. These have one value for each plan phase and transition to each phase. If the plan given in the example above were begun with the variable Point-in-plan at Conventional, the deterrence phase would be passed through with no actions taken.

```
Define AFCENT1-deterrence-phase:

    If Point-in-plan of AFCENT is at most
      Move-to-deterrence
    Then Perform AFCENT-deterrence-move.

    While Point-in-plan of AFCENT is at most Deterrence:
    {
      If (Today is at least C-Day of AFCENT)
        and Authorization of Deployment, AFCENT is Full
       Then Perform AFCENT1-deterrence-deployment-move.

      Wakeups are event- or time- driven

      Perform Sleep-to-next-move using the function
        AFCENT-wake-at-combat as planned-wakeup, and
        ((Today + 1) * 24) as time-limit.

      Force query governs phase change

      If the report from Ask-force-theater-conflict-level
        using Central-Europe as theater is at least Gen-conv
      Then Let Point-in-plan of AFCENT be Move-to-defense.
    }
End.
```

Fig. 8--Structure of phase function in RAND-ABEL analytic war plan

Note that because the performance of the initial move function, AFCENT-deterrence-move, depends on the phase marker Point-in-plan indicating transition into the phase, the move will only be performed once in the run. Although not shown here, within AFCENT-deterrence-move the variable Point-in-plan is changed from Move-to-deterrence to Deterrence. Thus, if the deterrence phase function is ever performed again because a new plan has been switched in, the move will not be performed.

Because the variable Point-in-plan is followed by the phrase "of AFCENT," it is shown not to be a single value but an array that has separate values for each command. Point-in-plan of AFCENT refers to the value for the command AFCENT, the current phase of the current AFCENT plan. The While statement causes the repeated execution of a block of statements, which must appear between braces. As long as the Point-in-plan of AFCENT remains Deterrence, the plan will remain in this phase.

Certain programming conventions, though not required for the RAND-ABEL code to execute, are used to improve readability. Here, the braces are aligned vertically and the block of statements they define are indented.

Within the While loop, the plan tests the conditions of the various moves that make up the phase, sleeps until the next day or possible other wakeup conditions are met, and then checks the conditions for changing the phase. The RAND-ABEL statement beginning "If (Today is at least C-Day of AFCENT)" is a typical form for a move, consisting of a conditional test which, if true, causes the move to be performed. It might seem that a While loop is not appropriate here, as one would order initial deployments only once. A single execution is generally not sufficient, however, because AFCENT can order allied, NATO forces to deploy only after their governments have put them on call to the NATO command, and those decisions (which can be simulated by Green Agent) cannot be assumed to occur immediately or simultaneously.

The function Sleep-to-next-move puts the plan to sleep, allowing other plans and agents to move and take actions, and specifies the conditions under which the plan will next wake. When the plan wakes again, it will resume execution just where it left off, with the statement following the Sleep-to-next-move function. The two arguments to the function, planned-wakeup and time-limit, specify the two conditions under which the plan will next move. The name of a function that tests one or more conditions is given for planned wakeup. In this case, the function AFCENT-wake-at-combat is given.

The argument time-limit specifies an absolute time, measured in hours from the beginning of the game (day 0, hour 0) for the next wakeup. Whichever of the two conditions occurs first will cause the plan to wake and continue execution. Today is a variable that always contains the current game-day. Thus ((Today + 1) * 24) is the start of the next day.

It has proved convenient to have each plan move regularly at the beginning of each day. While it would be possible to place the conditions for each move in the phase within the planned-wakeup function, so that the plan would wake the instant any move condition was met, in practice such a function would be unwieldy. A daily wakeup has been sufficient to test conditions for moves and seems consistent with the human planning cycle.

Following the wakeup on the new day, a test of the conditions under which the phase may be changed is made. If the phase is not changed, then the statements within the While loop are begun again. If the conditions are met, the variable Point-in-plan is changed to indicate transition to the next phase. The test for continuance of the While

loop then fails and the phase function is exited. Control returns to the top-level plan function and the next phase is entered.

Move Function

The structure of move functions is illustrated by Fig. 9, the initial move performed on entry into the AFCENT1-defense-phase.

This move function notifies higher authority that war has begun, performs procedures that issue orders to Blue forces, sets the AFCENT index of the variables D-Day and Point-in-plan, and logs a statement.

```
Define AFCENT1-forward-defense-move:
    Perform Notify-higher-authority using
      under-attack as reason, and
      no-recommendation as recommendation.
    Perform AFCENT1-forward-defense-order.
    Perform Weser-Lech-barrier-order.
    Let D-Day of AFCENT be Today
    Log-decision "  AFCENT - Defense phase".
    Let Point-in-plan of AFCENT be Defense.
End.
```

Fig. 9--Structure of move function

The form and content of move functions vary widely. The actions taken in a given move take place at the same particular time under the same specific conditions; however, the specific conditions are not fully known in advance. For that reason, many move functions must include conditional logic.

Procedure Functions

A procedure contains force order tables that issue orders to the various force models of the RSAS. Procedures may be written for a particular AWP, in which case the first part of its name is the plan name, or they may be written as general procedures. If

for a single plan, their on-line source code is in the file containing the plan's top-level, phase, and move functions; in this example, the file is Src/Blue/Awp/Afcent/afcent1.A. The general procedures are in file library.A for the appropriate command, such as Src/Blue/Awp/Afcent/library.A.

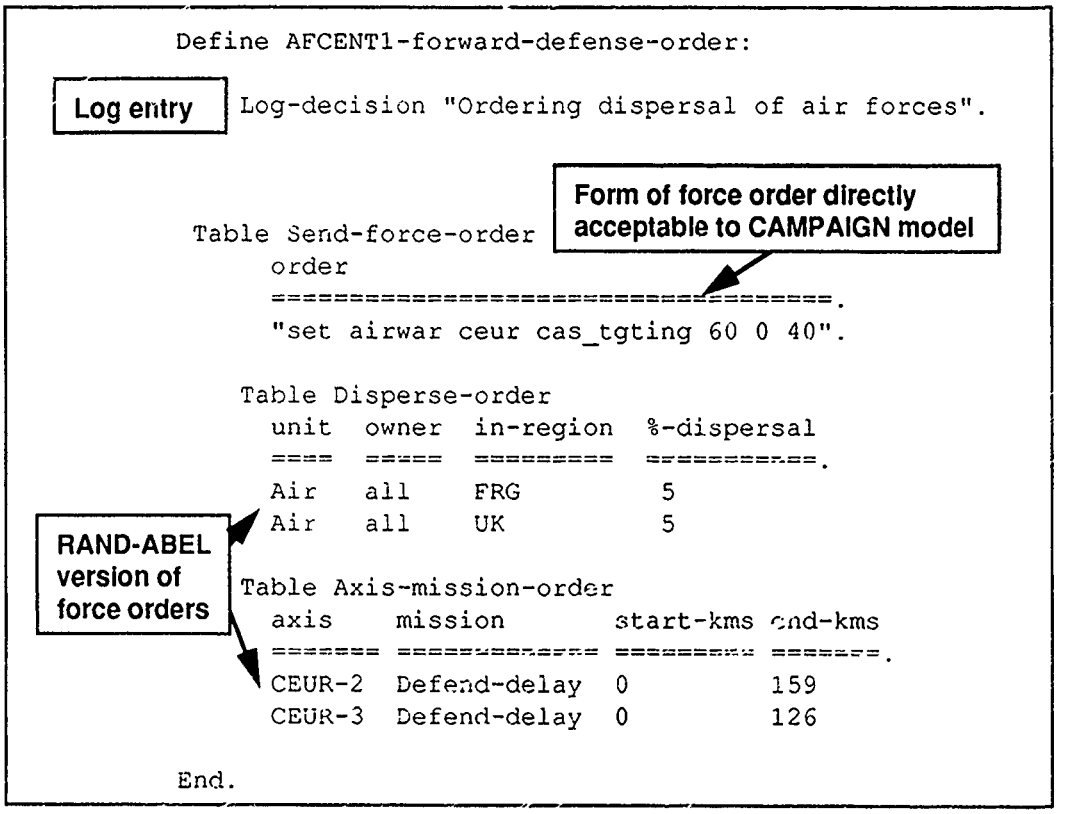

Fig. 10--Structure of procedure

Building Procedure Functions From Use Files

Sometimes the details of a scenario are first worked out by the user interactively typing all orders into CAMPAIGN; this is sometimes called "sandtabling." A series of CAMPAIGN use files, sets of related orders to CAMPAIGN formatted as the analyst typed them, may then be built up. It is a simple process to convert these use files to a RAND-ABEL control plan (as a prototype AWP) and then to the procedure functions performed by a fully structured AWP.

The following statements are CAMPAIGN orders (not their RAND-ABEL counterparts) assigning aircraft carrier taskgroups BCG.20_3 and BCG.20_7[1] to the taskgroup BCG.20_1 and deploying the combined 20_1 taskgroup to the Norwegian Sea at taskforce speed.

```
order US assign BCG.20_3  - - - BCG.20_1
order US assign BCG.20_7  - - - BCG.20_1
order US deploy BCG.20_1  - - - Norwegian-Sea taskforce
```

These three orders can be placed in a RAND-ABEL Send-force-order table for use in a CP or AWP. The Send-force-order table sends the quoted order to CAMPAIGN as it is written, and thus is the most direct way to place use file orders into RAND-ABEL. The following is an example of naval assignment orders:

```
Table Send-force-order

order
=============================================================.
"order US assign BCG.20_3 - - - BCG.20_1"
"order US assign BCG.20_7 - - - BCG.20_1"
"order US deploy BCG.20_1 - - - - Norwegian-Sea taskforce"
[End Table].
```

These strings are sent to a force model (CAMPAIGN-MT, the naval model, etc.), where they are parsed and executed. The correct format and spelling for these strings can be found on-line and in CAMPAIGN documentation, including data bases. The RSAS AWP- or CP-writer must check those sources. Although we do not give the force model formats in this Note, we have tried to indicate where the information can be found.

Alternatively, this can be expressed as a RAND-ABEL function, using RAND-ABEL forms of the orders:

```
Define LANT-deploy-3-carrier-taskgroup:

Table Assign-naval-order
force              to-force
===============    ============.
"BCG.20_3"         "BCG.20_7"
"BCG.20_1"         "BCG.20_7"
[End Table].
```

---

[1]The RSAS data base file vessel.sec uses "BCG" (Blue Carrier Group) in lieu of the more familiar "CVBG," as an abbreviation for aircraft carrier battle group.

```
Table Deploy-naval-order
  force      thru-region lat-lon      to-regio       at speed
  ========= =========== =======      ============== =========.
  "BCG.20_7"      --     "65N5E"      Norwegian-Sea Taskforce
[End Table].
End.
```

Documentation on the format of these order tables can be accessed through the RSAS background pull-down menu. The procedure is to use the right mouse button to display the pull-down, walking menus: ABEL-Rules/Interface/to-Force-C/Dict/order-func.D. Alternatively, accessing the rules from a shell window, this is the file Rsas/Src/Interface/to-Force-C/Dict/order-func.D.

Coordination Functions

Coordinating plans, in addition to moving through their own phases, have the added responsibility to select and manage their subordinate plans.

The first action of a coordinating plan is to choose and start executing its subordinate plans. These plans my be specifically named by the user through the scenario generator or a control plan, or chosen by the coordinating plan according to general guidance given by the NCL models. Each phase also includes functions that respond to notifications from subordinates and to communications from other countries.

By convention, Red and Blue agents send and receive all international communications at the Global Command Level (GCL), SHC for Red and JCS for Blue.

PREPARING AWPS

Preparing an AWP is not simply a matter of assembling a group of experts and having them run through a scenario. The work may include (1) substantial effort to make RAND-ABEL rules consistent with existing RSAS data- and rule-bases, (2) iterating the plan to make sure it really does what was desired and that any gaps or flaws in it get filled, and (3) focusing purposeful attention on "what ifs" to cover other than expected courses of action. It is usually better to insulate military experts from the computer program, lest they become confused or bogged down in nonsubstantive matters. Interactions with military experts must, however, be structured, lest it be inefficient or impossible to translate their discussions into AWPs. Fortunately (by design), the time- and event-sequenced structure of AWPs lends itself well to expert review in the form of time-sequenced lists of phases and operations, and the RAND-ABEL decision tables and order tables can readily be separated out and reviewed by military experts. To facilitate

military review of outcomes from running AWPs, it is helpful to include in the AWPs numerous logging statements, which record decisions, reasons, and notes in military English.

INPUTS TO EXECUTING AWPS

After AWPs are written, their execution can be varied through several input variables, set by human players (using the Data Editor), by National Command Level rules, by higher level AWPs, or by control plans.

The values of inputs are, in many cases, members of predeclared RAND-ABEL enumerations, which are similar to sets. By convention, the names of enumerations begin with "Type-." A complete listing of the values of these enumerations can be found in Section XI.

The values of most input variables can be viewed in the Data Editor using the tableau set User-generated/control.T.

Authorizations

Authorization for plans to take many important actions must be specifically granted through the Authorization variable. Authorization comes from the National Command Level models, the user, a control plan, or the scenario generator. The JCS or SHC coordinating plans can set some authorizations if those plans are authorized to do so.

To give an example, a RAND-ABEL statement authorizing full alert for AFCENT would appear as:

```
Let Authorization of Alert, AFCENT be Full.
```

The values for Blue authorizations are given in Table 6. Authorizations different for Red are shown in Table 7.

Table 6

BLUE AUTHORIZATIONS AND THEIR VALUES

Authorization	Values			
Airborne-alert	None	Full		
Alert	None	Sustained	Full	
Bastion-target	None	Full		
Biological	None	Full		
Chemical	None	Full		
Combat	None	Full		
Combat-initiation	Max-relative	Max-readiness	ASAP	
Deep-attack	None	Full		
Delegation	None	Nominal	Full	
Deployment	None	Full		
Dispersal	None	Full		
Disperse-leadership	None	Full		
Evacuate-cities	None	Full		
Jamming	None	Full		
Launch-satellite	None	Full		
Mobilization	Demobilize	Partial-mob	Full-mob	
Move-satellite	None	Full		
Nuclear	None	Demo-nuc	Limited-nuc	Massive-nuc
Open-ocean-ASW	None	Full		
Poise	None	Full		
Preempt-air	None	Limited	Full	
Release	None	Conventional	Chemical	
Reserve-commitment	None	Full		
Respond-in-kind	None	Limited	Full	
Sanctuary	Honored	Hot-pursuit	Occasional	
Special-operation	None	Full		
Termination	None	Full		
UCW	None	Full		
USSR-target	None	Full		

Table 7

RED AUTHORIZATIONS (WHERE DIFFERENT FROM BLUE)

Authorization	Values			
Alert	Withhold-alert	Increased-alert	Threat-of-war-alert	Full-combat-alert
Blue-engagement	None	Full		
Nuclear	None	Limited-nuc	Massive-nuc	
SNA-strike	None	Full		
US-target	None	Full		

Table 8

BLUE GLOBAL-AUTHORIZATIONS

Authorization	Values			
Mership-requisition	None	Full		
CRAF	II	III		
NATO-alert	Withhold-alert	Reinforced-alert	Simple-alert	General-alert

Global-authorization

Blue plans have three authorizations that are not specific to individual commands but apply worldwide, listed in Table 8. An If-Then statement conditional on NATO's having gone to an alert level of at least Simple-alert would be written as:

```
If Global-authorization of NATO-alert is at least Simple-alert
Then . . . .
```

M-Day

M-Day, set by command, is the day on which forces assigned to that command begin mobilization. For example, the following statement would set M-Day for CENT to game day five:

```
Let M-Day of CENT be 5.
```

C-Day

C-Day, set by command, is the day on which forces assigned to that command begin deployment. For example:

```
Let C-Day of CENT be 5.
```

D-Day and Expected-D-Day

D-Day, set by command, is the day on which combat begins in the arenas belonging to that command. D-Day is used by the attacker (normally Red) and Expected-D-Day by the defender (normally Blue). D-Day and Expected-D-Day are referred to as:

```
Let D-Day of HCFFE be 15.

Let Expected-D-Day of PAC be 17.
```

Notifications

Preplanned communications up the Red or Blue chain of command are represented by the function Notify-higher-authority. which passes on a reason and recommendation. The declared values of reason and recommendation are listed in Section XI. The form of the statement is:

```
Perform Notify-higher-authority using Under-attack as reason and
No-recommendation as recommendation.
```

This function causes the AWP to sleep, allowing a higher-level, coordinating AWP to respond. A plan executing a notification cannot know if or how higher authority may respond; therefore, plan writers must anticipate various eventualities. It is generally prudent to assume that no response means "carry on under previously granted guidance and authorizations."

Bounds

In addition to preplanned communications represented by notifications, AWPs notify higher authority of violation of active bounds. Bounds can be thought of as conditions that, if arising, might prompt the NCL to reconsider strategy or guidance. The current list of bounds is given in Section XI.

Bounds are turned on by the statement:

```
Let Bound of <bound name, as enumerated in Type-bound>[2], <command name,
as enumerated in Type-command> be On.
```

Each bound has associated with it a function that is tested at every clock advance. These functions are in file Rsas/Src/NCL/Blue/SamN/Decide/Controls/Theater/Bounds-on-war-plans.A for Blue, and /Red/IvanO/ for Red. Each AWP has a hidden wakeup rule that performs these bound testing functions for each bound that is on. When the function triggers (that is, when its conditions are true, causing its "then" action to execute), a notification is automatically generated without the AWP waking up.3

Many bounds also have threshold values that specify when the bound breaks. For example, there is an Enemy-mobilizing bound, whose threshold value can be set to the

---

[2]The angle bracket notation indicates a value to be specified. Here, one would specify a bound name and command name, as in "Let Bound of Combat-occurring, AFCENT be On."

[3]This is handled in the AWP utility function "Sleep-to-next move."

number of equivalent divisions considered to indicate mobilization is occurring. The format for setting Bound-threshold is:

```
Let Bound-threshold of <bound name>, <command name> be <numerical
value>.
```

When running with the automated NCL models, these bounds wake the NCLs to make a move. Using the scenario generator, the notifications generated by broken bounds may be used to trigger events. Using control plans, broken bounds are turned off as they occur, although the bound testing functions are often used directly as wakeup functions for moves.

Intl-comm-reporting-requirement

If "Yes," this requires the GCL command to notify the NCL of any international communications received, i.e., messages from another country.

```
Let Intl-comm-reporting-requirement be Yes.
```

Pre-mob-directive (Red)

This directs the GCL command to initiate premobilization training immediately.

```
Let Pre-mob-directive be <value in enumeration Type-special-action-
authorization>.
```

Automated NCL Guidance for Picking Plans

In the Automated mode of running the Blue and Red Agents, the NCL models (Sams and Ivans) do not specify the specific AWPs to run in each command, but instead specify the desired escalation level, objectives, and strategies (as well as the control variables mentioned previously). From these guidances, the GCL AWPs (JCS and SHC) choose the best fitting plan.

Escalation-guidance specifies for each command the level of hostilities, and implicitly the weapons to use, in order to achieve its objective.

```
Let Escalation-guidance of <command> be <value in enumeration Type-
military-involvement>.
```

Objectives are the goals for each command.

```
Let Objective of <command> be <value in enumeration Type-operational-
objective>.
```

The strategy for each command is made up of the following component variables:

Variable	Meaning
General-target-withhold	Withhold attack on allies, neutrals, or noncombatants.
Specific-target-withhold	Withhold attack on specific countries.
Target-withhold	Withhold attack on specific classes of targets.
Theater-priority	Importance of the theater. Primary theaters will not be drawn down to support secondary theaters.
Delegate-authority	Level of delegation of NCL authority to the command.
Delegation-withhold	Circumstances under which the delegation of authority is revoked.
Delegated-control-of-forces	The types of forces over which control is delegated to a command.
Conditions-for-use	Conditions under which delegated authority may be used.
ROE-for-self-defense	How a command may engage the enemy if attacked.
Combat-tempo	Intensity and pacing of combat.
Ground-strategy	Strategy for ground forces.
Air-strategy	Strategy for air forces.
Targeting-strategy	Strategy for SAC/SNF strategic missile forces.
Naval-strategy	Strategy for naval forces.
Deception-strategy	Strategy for deception.
Termination-strategy	Strategy for termination.

```
Let General-target-withhold of <value in enumeration Type-general-target-
withhold> be Yes.
Let Specific-target-withhold of <value in enumeration Type-country> be Yes.
Let Target-withhold of <value in enumeration Type-target-withhold> be Yes.
Let Theater-priority of <value in enumeration Type-command> be <value in
enumeration Type-theater-priority>.
Let Delegate-authority of <value in enumeration Type-command> be <value in
enumeration Type-delegated-authority>.
Let Delegation-withhold of <value in enumeration Type-command> be <value in
enumeration Type-delegation-withhold>.
Let Delegated-control-of-forces of <value in enumeration Type-command> be
<value in enumeration Type-forces-controlled>.
Let Conditions-for-use of <value in enumeration Type-command> be <value in
enumeration Type-delegation-condition>.
Let ROE-for-self-defense of <value in enumeration Type-command> be <value
in enumeration Type-self-defense>.
Let Combat-tempo of <value in enumeration Type-command> be <value in
enumeration Type-combat-tempo>.
Let Ground-strategy of <value in enumeration Type-command> be <value in
enumeration Type-ground-strategy>.
Let Air-strategy of <value in enumeration Type-command> be <value in
enumeration Type-air-strategy>.
Let Targeting-strategy> be <value in enumeration Type-targeting-strategy>.
Let Naval-strategy of <value in enumeration Type-command> be <value in
enumeration Type-naval-strategy>.
Let Deception-strategy of <value in enumeration Type-command> be <value in
enumeration Type-deception-strategy>.
```

```
Let Termination-strategy of <value in enumeration Type-command> be <value
in enumeration Type-termination-strategy>.
```

Mob-duration indicates the desired mobilization duration without being specific. A short mobilization is for short-warning invasions, while a long mobilization is for 25 to 30 days of preparations before D-day. Best refers to the optimal choice of mobilization duration, either short or long.

```
Let Mob-duration of <command> be <value in enumeration Type-mob-
duration>.
```

Alliance-criteria indicates whether the alliance is Cohesive or there are Problems. A value of Unspecified means alliance cohesion is not to be considered in plan selection.

```
Let Alliance-criteria of <command> be <value in enumeration Type-
alliance-criteria>.
```

OUTPUTS

Analytic war plans issue orders to the RSAS force models through RAND-ABEL order tables. The JCS and SHC war plans communicate to Green Agent through Cable and Announcement functions that give desired third-country postures. All plans also communicate with their superior plans in the command hierarchy through the Notify-higher-authority function, giving the reason for the communication and a recommendation for action. Communication downward is through authorizations and other controls.

A log tracing the execution of the Red and Blue Agents is available through the background menu. Log statements in the analytic war plans write execution information into the game log at three levels of detail: decisions only, decisions and reasons, and decisions, reasons, and notes. Log information can be viewed during or after the game at any level up to the level written.

STRUCTURE OF CONTROL PLANS[4]

Use of Control Plans

Control plans are standardized interpreted functions allowing the analyst to schedule interventions such as parameter changes or orders to forces on the basis of time

[4]Previous documentation (e.g., Davis and Hall, 1988, pp. 59 f.) defines "analyst plans" and "control plans."

or condition in the simulation.[5] For example, the baseline AWP might not employ certain units explicitly, leaving their employment to be determined by a general force-allocator program called the Ground Commander Model embedded in Campaign-MT. A control plan, however, might specify that, in addition to all the orders coming from the baseline plan, specific orders should be sent to these particular units at specified times or events.

Control plans can represent the analyst by changing the laws of war or inserting exogenous events, can represent and supplement AWPs by issuing orders to forces, and can play the NCL by picking AWPs and setting AWP guidance. Often a control plan is a mix of the three.[6] In the role of AWPs, control plans have often been used in the AWP development process to test in the interpreter the orders of a planned AWP before building its more complex structure.

One control plan exists for each of the Blue, Red, Green, and Force Agents. All are run by Control Agent. Default copies of these control plans can be found in the file Rsas/Run/INT/Hide/analyst-plan.A, along with documentation and examples.

File Structure

Control plans are often grouped in Analyst Plan files, as shown in Fig. 11, which is adapted from Davis and Hall, 1988, p. 59.

An Analyst Plan file may contain modified functions as shown in the figure, or such functions may be in separate files, such as red.A and blue.A. In either case, the Analyst Plan file and any other ".A" suffix files to be interpreted must be in or linked to the RSAS/Run/INT directory.

---

[5]Control plans are part of the larger "analyst plan," which is the interpreted files collecting the analyst's special instructions or modifications for the particular run or set of runs in question. Typically, they will include a number of statements establishing values for combat-model parameters and specifying such administrative matters as log level, the displays to be automatically reported into the log, and game duration. They may also contain statements changing decision-model parameters for Green, Red, or Blue. And they may contain modified versions of functions appearing in any of the RAND-ABEL models used in the simulation. These modified versions will then be used interpretively instead of the compiled versions during the run.

[6]If a control plan is used to define a scenario through AWP selection and controls, it is a good idea to avoid also using the scenario generator, through the Data Editor or through application of a delta WSDS. Both use some of the same mechanisms and can easily step on each other's efforts.

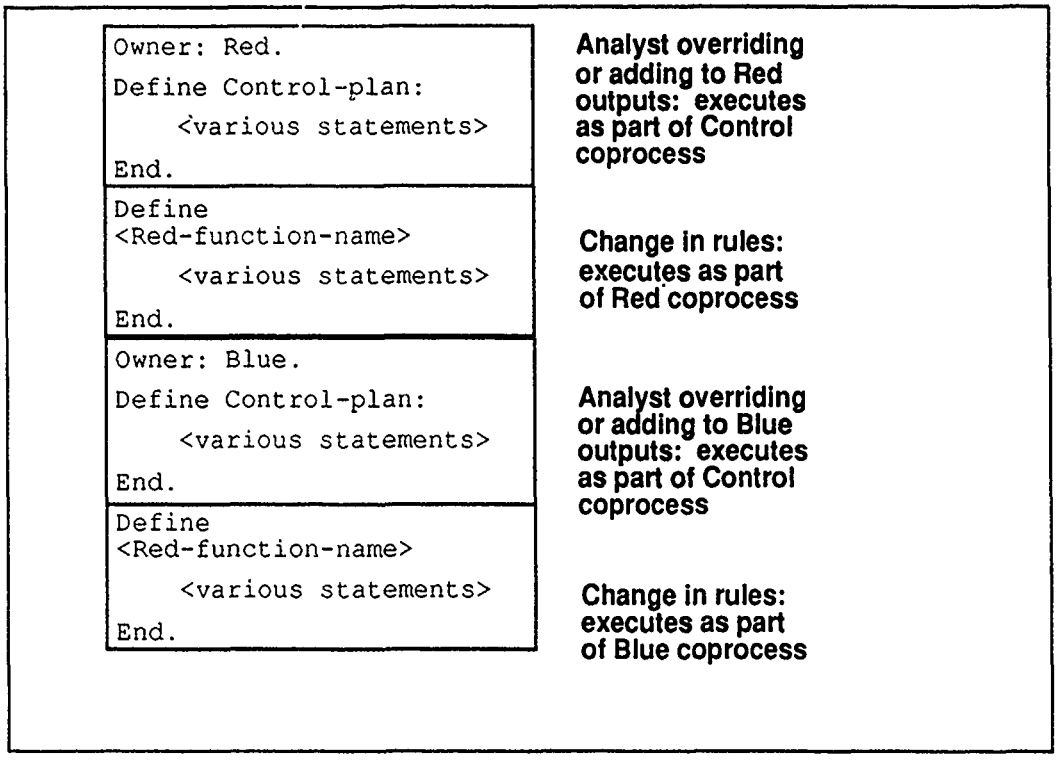

Fig. 11--Schematic of Analyst Plan file

Move-number Structure

The most commonly used control plan structure tests a move number to distinguish moves and sets predefined variables to specify wakeup time limits and conditions.

```
Owner: Blue.

Define Control-plan:

    [ Move 0 ]

    If Move-number is 0
    Then
    (
     [ Actions ]

     Let Next-move-time-limit be Time-in-hours + 24.
     Let Next-move-planned-wakeup be the function Never-wake.
     Let Move-number be 1.
     Exit.
    )
```

```
    [ Repeat for move 1, etc. ]
End.
```

The variable Move-number determines the move that will be done at the next wakeup. It begins with the value 0, so the first move must always be numbered 0.

The variable Next-move-time-limit specifies the time-limit for the next move. If the condition tested by the planned-wakeup function is not met by the time-limit, the plan will wake up. The time limit is measured in hours from the beginning of the game, which is day 0, hour 0. A time-limit for day 2, hour 0 would be 48. Time-in-hours gives the current game time measured in hours. In the example above, "Time-in-hours + 24" sets the Next-move-time-limit for 24 hours in the future.

The variable Next-move-planned-wakeup specifies the wakeup function to be tested each time-advance while the plan is asleep. When the condition in the wakeup function is true, or, more technically, the wakeup function exits reporting Yes, the plan will wake up. The function Never-wake will never cause a wakeup.

Each set of actions must be put between the braces of a move as given above. The control plan executes statements from its beginning each time after waking up. Thus the value of Move-number controls which move is performed. The conditions for the next move, Next-move-time-limit and Next-move-planned-wakeup, must be reset within each move. If they are not, the plan will sleep with the same wakeup conditions as triggered the current wakeup and will wake up again immediately. If Move-number is not reset then the same move will be done next. The Exit statement is not required, but shows explicitly that only the one move will be performed.

The last move should always set Next-move-time-limit to "never" and Next-move-planned-wakeup to "Never-wake." An error message about a coprocess trying to kill itself will be generated if this is not done and the plan runs beyond its last move.

Interpreting Sleeping Functions

Analysts who wish to make interpretive changes during a game to a function containing a sleep statement (such as an AWP phase function) must be aware of the following rule: Interpretive changes made to a sleeping function will be ignored.

A sleeping function is one that has executed a sleep statement, such as Sleep-to-next-move, and has stopped executing, waiting for its wakeup rules to be triggered. For

typical analysis purposes, this would only be an AWP function while the AWP is performing that phase.

When an AWP sleeps, the state of the function that performed the sleep is saved in order that it be able to resume, when awakened, precisely where it left off. This consists of remembering the point in the function at which the sleep was performed, as well as the value of all local variables. If interpretive changes to the function were allowed while it was sleeping, then the remembered point in the function could be rendered meaningless; the sleep statement could even have been removed. Therefore, any such attempted new interpretation is ignored.

Put another way, the form of a function may not be changed while the function is executing, which includes sleeping as a form of suspended execution. Note that if an interpretation of that function had been in place when the function began executing, then it would be that interpretation that would be preserved, and all further changes ignored (including the removal of the interpretation) until the function exited.

In practice, then, do not make interpretive changes to an AWP phase function[7] while the AWP is executing that phase. Changes may be made while the plan is in a prior phase (changes while in a following phase would have no effect on the current game).

Since reading a WSDS is effectively resuming a game at the point where the WSDS was saved, this rule also applies to saved WSDSs. Interpretive changes to functions sleeping when the WSDS was saved will be ignored when the WSDS is read and execution resumed.

TABLES FOR SCENARIO DEFINITION

The following tables can be used to define a scenario through a control plan.

Start-new-AWPs (Blue)

```
Table Start-new-AWPs

jcs  sac  eur  afnorth  afcent  afsouth  cent  korea  lant  pac
==== ==== ==== ======== ======= ======== ===== ====== ========.
JCS1 --   EUR1 AFNORTH1 AFCENT2 AFSOUTH2 --    KOREA1 LANT1 PAC1.
```

[7] In addition to the sleeping function, the function that performed the sleeping function (and the function that performed it, etc.) may not be changed. All have points within them saved when the sleep was performed.

This causes the specified Blue AWPs to be started. Unspecified (--) leaves the current plan in effect.

Start-new-AWPs (Red)

```
Table Start-new-AWPs

  shc  snf  nwcom  hcfw  hcfsw  hcfs  dprk  hcffe
  ==== ==== ====== ===== ====== ===== ===== ======.
  SCH1 --   NWCOM1 HCFW4 HCFSW2 --    DPRK1 HCFFE1.
```

This causes the specified Red AWPs to be started. Unspecified (--) leaves the current plan in effect.

Force-order-event

```
   Table Force-order-event
   event-# day hour period stop-day display order-string
   ======= === ==== ====== ======== ======= ========================.
         1   5    0      0        0      No "set govt US air-mult 1.3"
         2   5    0     24       20     Yes "display xland CEUR"     .
```

This creates an event in the Scenario Generator Force Displays and Orders list. At the specified day and hour the order-string is issued to Force. If period is greater than 0, it will be issued again in that many hours, until the value for stop-day is reached. For displays to appear in the log, display must be Yes. Up to 30 events per side may be defined in a given game.

Green-event

```
Table Green-event
  event-#  day hour  country  side  cooperation  involvement
  =======  === ====  =======  ====  ===========  ===========.
  1        3   0     Belgium  Blue  Transit      On-call     .
```

This creates an event in the Scenario Generator Green Agent event list, specifying the postures for a country to take at the given day and hour. On the succeeding Green Agent move, the country will issue orders appropriate to its new postures. However, Green Agent will make no moves thereafter for the country, assuming that its play has been taken over by the analyst. Up to 30 events may be defined.

Action-event

```
Table Action-event
  event-# day hour duration actor name            region      .
  ======= === ==== ======== ===== ================ ===========.
        1   3    0      240   Red City-evacuation USSR-Moscow.
```

This creates an event in the Scenario Generator Exogenous Actionlist, specifying the actions to be taken in the Flag model at the given day and hour. See Section IX for further information on the Flag model. Up to 30 events may be defined.

SM-apply-delta-wsds

```
Table SM-apply-delta-wsds
  file             directory
  ===============  =========.
  "D.Europe.cvtd"  "Wsds"
```

This causes System Monitor (SM) to apply the given delta WSDS. The directory path given is relative to the Run directory.

SM-write-wsds

```
Table SM-write-wsds
  file       directory  description
  =========  =========  ===========.
  "newwsds"  "Wsds"     "New Wsds" .
```

This saves the current game state as a WSDS file. The directory path given is relative to the Run directory.

Stop-game

```
Perform Stop-game.
```

This stops the game, without quitting.

Quit-game

```
Perform Quit-game.
```

This exits the game.

EXAMPLES

The next three sections provide detailed listings of a Red control plan and two Blue analytic war plans that can respond to it. The functions are presented as they appear in the on-line source code, except that explanations have been inserted as footnotes and some classified material has been deleted. For the most part, what makes the on-line code classified is identification of forces by name.

III. (RED) CONTROL PLAN: ATTACKS AGAINST IRAN AND NATO

In this section we list a Red Control Plan as it would appear in an on-line RSAS file. Comments and Log statements provide self-contained documentation; additional comments appear here as footnotes. The timeline is diagrammed in Fig. 12.[1] The scenario is for illustrative purposes; all events occur on days that are even multiples of five.

Day	0	5	10	15	20	25	30	35	40	45	50
HCFS		• M- & C-day				• D-day					
HCFW				• Civil unrest				• M- & C-day			• D-day
NWCOM								• M- & C-day			• D-day
HCFSW								• M- & C-day			• D-day
HCFFE								• M- & C-day			• D-day
DPRK								• M- & C-day			
	0	5	10	15	20	25	30	35	40	45	50

Fig. 12--Timeline for Red Control Plan

- The plan assumes dissolution of central authority in Iran. The Soviets watch the situation; after five days (day 5), they alert their forces in the Southern TVD for a possible opportunistic invasion of Iran.
- Civilians in several Eastern European countries begin demonstrations. The Soviets respond by alerting their forces in Non-Soviet Warsaw Pact (NSWP) countries and ordering NSWP indigenous forces to increased alert (day 15).
- Following twenty days of preparations (day 25), the Soviets invade Iran but do not attack any U.S. forces outside Iran.
- Five days later (day 30), the DPRK communicates with the USSR, seeking support for an invasion of the ROK.
- The Soviets begin to mobilize in Europe and the Far East (day 35).
- After fifteen days of preparation (day 50), the Soviets and their Warsaw Pact allies attack in Europe. They do not support the DPRK, which remains at high alert but does not attack. Soviet air attacks U.S. bases in Japan and nuclear storage sites in the ROK. This is summarized in Table 9.

[1]The abbreviations for Red Commands were defined in Table 1.

Table 9

SUMMARY OF RED CONTROL PLAN

Day	Red Action
05	HCFS M- and C-day
15	Civil unrest in NSWP prompts alerting Pact forces in E Eur
25	HCFS D-day invasion of Iran No attacks against Blue naval forces
35	HCFW M- and C-day NWCOM M- and C-day HCFSW M- and C-day HCFFE M- and C-day DPRK M- and C-day
50	HCFW D-day NWCOM D-day HCFSW D-day HCFFE D-day; US bases in Japan and nuclear storage in ROK struck DPRK D-day deferred Attack Blue naval forces worldwide

```
Owner: Red.[2]

Define Control-plan
[**** DAY 0 ************************************************************][3]

If Move-number is 0[4]
Then
{
    Log-note "  Red will log everything".
    Let Agent-log-level of Red be Log-everything.

    Let Next-move-time-limit be 5 * 24.[5]
    Let Move-number be 5.
    Exit.
}
```

[2]The file will not interpret without an "Owner "statement.

[3]This style of comment is used to separate moves. All moves in an analyst control plan must be within a single function, "Control-plan," not as separate functions as is the case with analytic war plans. The Control-plan function may, however, call other functions, which may be in the same or other files.

[4]This analyst control plan follows the convention of numbering its moves to coincide with the game days on which they are scheduled to occur.

[5]The next move will occur in five days, on day five.

```
[**** DAY 5 ************************************************]

If Move-number is 5
Then
{
    Log-note "Red move on day 5".

    Log-decision "  Red decides to invade Iran".
    Log-reason   "    because of opportunity presented by situation".

    Log-decision "  M-day of HCFS is today".
    Let M-Day of HCFS be Today.
    Let Authorization of Mobilization, HCFS be Full-mob.[6]

    Log-decision "  C-day of HCFS is today".
    Let Authorization of Deploy, HCFS be Full.
    Let C-Day of HCFS be Today.

    Log-decision "  D-day of HCFS is set to day 25".
    Let D-Day of HCFS be 25.

    Table Start-new-AWPs
      shc  snf  hcfw  nwcom    hcfsw    hcffe    hcfs  dprk
      ==== ==== ====  ======== ======== ======== ===== ====.
      SHC1 --   --    --       --       --       HCFS2 --  .[7]

    Let Next-move-time-limit be 15 * 24.
    Let Move-number be 15.
    Exit.
}

[**** DAY 15 ***********************************************************]

If Move-number is 15
Then
{
    Log-note "Red move on day 15".

    Log-decision "  Mobilization of Soviet forces in Eastern Europe".
    Log-reason   "    prompted by unrest in Eastern Europe".[8]
```

[6]AWP HCFS2 schedules mobilization for M-day, as set here. On the scheduled day, however, it will *order* mobilization only if it is authorized.

[7]Whenever a subordinate AWP, such as HCFS2, is started, a Global Command Level AWP, such as SHC1, must also be started. The "--" beneath a command name means that its AWP is not to be changed.

[8]Here, RSAS does not model (simulate) unrest in Eastern Europe; it simply records such as the reason for mobilization of Soviet forces.

```
    Table Mobilize-order
      unit owner command arena in-region      %-ready
      ==== ===== ======= ===== ============== =======.
      all  USSR  --      --    GDR            100
      all  USSR  --      --    Poland         100
      all  USSR  --      --    Czechoslovakia 100
      all  USSR  --      --    Hungary        100
[End Table].

    Log-decision "  Red asks NSWP allies to alert their forces".[9]

    Table  Cable[10]
                                          home-       other-      other-
      country        side cooperation     involvement involvement area
      ============== ==== ========== ========== ========== ======.
      GDR            Red  Transit     Full-alert --         --
      Poland         Red  Transit     Full-alert --         --
      Czechoslovakia Red  Transit     Full-alert --         --
      Hungary        Red  Transit     Full-alert --         --
    [End Table].

    Let Next-move-time-limit be 25 * 24.
    Let Move-number be 25.
    Exit.
}

[**** DAY 25 ************************************************************]

If Move-number is 25
Then
{
    Log-note "Red move on day 25".

    If Today >= D-Day of HCFS
    Then
    {
     Log-note "  HCFS2-conventional-move has been modified".[11]
     Log-note "    in INT/red.A to delete Red attack on Blue naval".
     Log-note "    forces in the Arabian Sea".
     [  If attack against Blue naval forces IS desired, remove
        brackets from the following statements]
```

---

[9]Note the distinction here: Red can issue an order, such as a "Mobilize-order"directly to its forces, whether in the Soviet Union or abroad, but it cannot order forces not under its command. The following "Cable" will be acted upon by Green agent on behalf of the recipient NSWP countries.

[10]Here, Red is asking these NSWP allies to side with the Soviet position, to allow Red forces to transit their territories, and to put their forces in full alert.

[11]To use control plans to control AWPs intelligently, analysts must know what is in the AWPs. The standard HCSF2 plan has Red attack Blue naval forces in the Persian Gulf and Arabian Sea. In the present scenario, however, Red wishes to have the option of containing the conflict within Iran; hence, the naval attacks are deleted from HCFS2, lest Blue spread the conflict further. The modified HCFS2-conventional-move is in file Run/INT/Hide/red.A.

```
    [
      Log-decision "  Red will attack Blue naval forces in region".
      Perform HCFS2-naval-attack-order.
    ]
    }

    Log-decision "  Warsaw Pact sets Threat of War state of readiness".
    Log-reason   "    prompted by NATO's Military Vigilance".
    Let Authorization of Alert, HCFW be Threat-of-war-alert.

    Let Next-move-time-limit be 35 * 24.
    Let Move-number be 35.
    Exit.
}

[**** DAY 35 ************************************************************]

If Move-number is 35
Then
{
    Log-note "Red move on day 35".

    Log-decision "  Red decides to attack NATO's central region".
    Let C-Day of HCFW  be Today.
    Let Authorization of Deployment, HCFW  be Full.
    Let M-Day of HCFW  be Today.
    Let Authorization of Mobilization, HCFW  be Full-mob.
    Let Authorization of Alert, HCFW  be Full.
    Let D-Day of HCFW  be (Today + 15).

    Log-decision "  Red decides to attack NATO's northern flank".
    Let C-Day of NWCOM  be Today.
    Let Authorization of Deployment, NWCOM  be Full.
    Let M-Day of NWCOM  be Today.
    Let Authorization of Mobilization, NWCOM  be Full-mob.
    Let Authorization of Alert, NWCOM  be Full.
    Let D-Day of NWCOM  be (Today + 15).

    Log-decision "  Red decides to attack NATO's southern flank".
    Let C-Day of HCFSW  be Today.
    Let Authorization of Deployment, HCFSW  be Full.
    Let M-Day of HCFSW  be Today.
    Let Authorization of Mobilization, HCFSW  be Full-mob.
    Let Authorization of Alert, HCFSW  be Full.
    Let D-Day of HCFSW  be (Today + 15).

    Log-decision "  Red decides to attack Blue forces in Pacific".
    Let C-Day of HCFFE  be Today.
    Let Authorization of Deployment, HCFFE  be Full.
```

[12]This is a very useful technique for using one analyst control plan to control several variants on a baseline case.

[13]Note here that the change in Pact readiness is logged as a decision, but the reason is logged as a reason. If this control plan were used in a game in which there were Blue players, they might be shown Red logs at the "Decisions-only" level; they would not necessarily know why Pact readiness had been increased.

```
Let M-Day of HCFFE  be Today.
Let Authorization of Mobilization, HCFFE  be Full-mob.
Let Authorization of Alert, HCFFE  be Full.
Let D-Day of HCFFE  be (Today + 15).

Log-decision "  Red decides to support possible attack against ROK".
Let C-Day of DPRK  be Today.
Let Authorization of Deployment, DPRK  be Full.
Let M-Day of DPRK  be Today.
Let Authorization of Mobilization, DPRK  be Full-mob.
Let Authorization of Alert, DPRK  be Full.
Log-note     "    but D-day of DPRK is not yet established".
[
Let D-Day of DPRK  be (Today + 15).[14]
]

If (Today >= M-Day of HCFW) and (Today >= M-Day of DPRK)[15]
Then
{
 Table Start-new-AWPs
   shc  snf  hcfw  nwcom    hcfsw   hcffe    hcfs  dprk
   ==== ==== ====  ======== ======= ======== ===== ====.
   SHC1 SNF1 HCFW8 NWCOM1   HCFSW1  HCFFE1   HCFS2 DPRK1.[16]

}
Else If Today >= M-Day of HCFW
Then
{
 Table Start-new-AWPs
   shc  snf  hcfw  nwcom    hcfsw   hcffe    hcfs  dprk
   ==== ==== ====  ======== ======= ======== ===== ====.
   SHC1 SNF1 HCFW8 NWCOM1   HCFSW1  HCFFE1   HCFS2 --.

}
Else If Today >= M-Day of DPRK
Then
{
 Table Start-new-AWPs
   shc  snf  hcfw  nwcom    hcfsw   hcffe    hcfs  dprk
   ==== ==== ====  ======== ======= ======== ===== ====.
   SHC1 --   --    --       --      HCFFE1   HCFS2 DPRK1.

}
```

[14]The brackets cause this statement to be bypassed. If running a scenario in which the DPRK attacks the ROK, remove the brackets.

[15]This applies if Red is mobilizing for war in both Europe and Korea. It was convenient to let Central Europe (HCFW) serve to test for all of Europe. If an analyst wanted to run cases in which Red might attack parts of NATO, then the logic would have to be extended.

[16]Although this starts plan SNF1, a strategic nuclear war plan, it does not authorize dispersal or weapons release, which would be done through separate orders. Again, the analyst must know what is in the AWPs that are used.

```
    Let Next-move-time-limit be 50 * 24.
    Let Move-number be 50.
    Exit.
}

[**** DAY 50 ************************************************************]

If Move-number is 50
Then
{
    Log-note "Red move on day 50".

    If Today >= D-Day of HCFW
    Then
    {
        Log-decision "  Red attacks Blue naval forces SWA".
        Log-reason   "    coincidentally with attacks in Europe".
        Perform HCFS2-naval-attack-order.[17]
    }
}

[**** DAY 50 AND THEREAFTER ***************************************************]

If Move-number >= 50
Then
{
   If Today >= D-Day of HCFFE and
   Point-in-plan of HCFFE is not Termination[18]
   Then
   {
      If the report from Ask-force-count-totals-by-region[19]
     using Carrier          as unit,
           Blue             as side,
           US               as owner, and
           NW-Pac-Basin     as region >  0
       Then
       {
          Log-decision "  Attacking CVBG in NW Pac Basin on day " Today.
          Table Strike-order[20]
            unit-name         weapon   qty  at-govt target
            ================ ======== ==== ======= ================.
                                          US      "CVBG NWPBasin".

       }
```

[17]Although provision was made earlier for invading Iran without attacking Blue forces at sea, once Red attacks NATO, there is no longer reason not to attack Blue naval forces in the Arabian sea. The HCFFE1 and NWCOM1 AWPs will attack Blue naval forces in the Pacific and Atlantic Oceans, respectively.

[18]This will execute once daily from day 50 until the termination phase or the game stops (set earlier to be on day 75).

[19]This checks to see if there is a Blue aircraft carrier in the Northwest Pacific Basin.

[20]Classified versions would specify Red units ordered to strike Blue CVBGs.

```
      If the report from Ask-force-count-totals-by-region
     using Carrier          as unit,
           Blue             as side,
           US               as owner, and
           Bering           as region > 0
      Then
      {
         Log-decision "  Attacking CVBG in Bering Sea on day " Today.
         Table Strike-order
           unit-name        weapon   qty  at-govt target
           ================ ======== ==== ======= =============.
                                          US      "CVBG Bering".

      }

   Let Next-move-time-limit be ((Today + 1) * 24).
   Let Move-number be (Move-number + 1).
   Exit.
   }
}
End.
```

IV. AFCENT1: A FORWARD DEFENSE OF NATO'S CENTRAL REGION[1]

Having seen in Section III a Red Control Plan for attacks against Iran, NATO, and (possibly) Korea, we turn now to an Analytic War Plan that could be used to counter its attack against NATO's Central Region. The plan is summarized in Table 10, which shows the names of the major Blue actions in each phase.

Table 10

SUMMARY OF BLUE AWP AFCENT1

Phase	Blue Action[2]
Deterrence	Deterrence move
	Deterrence deployment move
	IGB barrier order
	Early reinforce order
	Preemptive air move
	Initial forward air defense order
	Support Austria move
Defense	Forward defense move
	Deterrence deployment move
	Adjust priority
	Initial defense move
	Widen air defense move
	UK CAS deployment move
	Ems-Neckar barrier order
	Support Austria move
	Realign FRG II Corps
Nuclear	Nuclear move
	Deterrence deployment move
	Demonstrative nuclear use move
	Battlefield nuclear use move
	Theater nuclear use move
	Massive military nuclear use move
Post-nuclear	Post-nuclear move
Termination	Termination move

Figure 13 shows the timeline.

[1]This AWP is in file Src/AWP/Blue/Afcent/afcent1.A. The .A suffix in RSAS file names indicates the file is RAND-ABEL source code.

[2]Many of these Blue actions are conditional on events or authorizations.

Phase	Deterrence	Defense	Nuclear	Post-Nuc Termination
Ground	Deploy	Defend forward	Disperse*	
Air	Deploy	Fwd air defense	Disperse*	
Defenses	IGB barrier*	Weser-Lech barrier		
Reporting	Late allies	Under attack		Terminating

*As authorized

Fig. 13--Timeline for AFCENT1

The theater is depicted in Fig. 14, showing axes as outlined numbers.

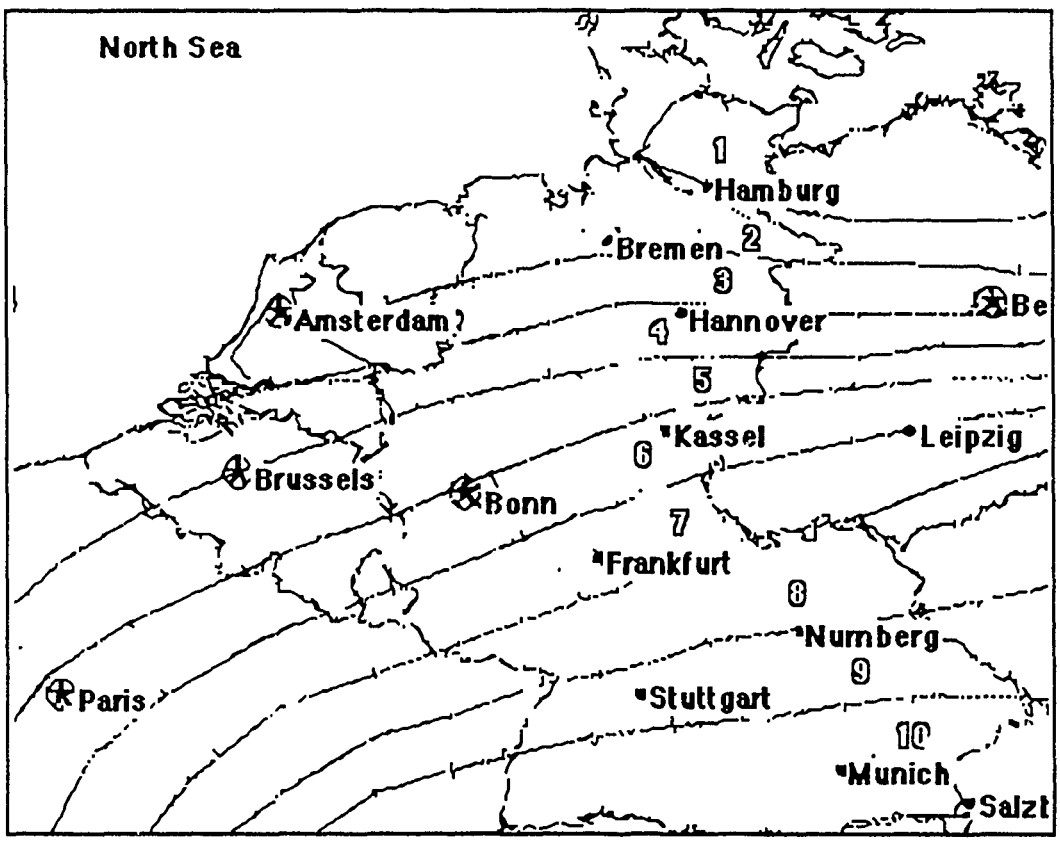

Fig. 14--Map of Central European theater

Plan-AFCENT1[3]

```
[
PURPOSE[4]

Defend NATO's Central Region against attack by Warsaw Pact forces.

STRATEGY

Deter attack, if possible; otherwise, conclude hostilities as soon as
possible under favorable terms, by executing NATO's strategy of forward
defense and flexible response.

COORDINATING INSTRUCTIONS

This plan is consistent with the following Objective of JCS:[5]

      Destroy-Soviet-Union
      Defeat-Red-worldwide
      Defeat-Pact
      Defend-alliances
      Limit-coalition-losses
      Limit-US-losses
      Support-allies
      Unspecified

This plan is consistent with the following Escalation-guidance for this
theater:  all levels.

This plan is consistent with the following Objectives of AFCENT:

      Pursue
      Restore
      Hold
      Limit-losses
      Limit-US-losses
      Deter
      Unspecified

This plan is consistent wit.. the following Ground-strategy for this
theater:  Forward.

ORGANIZATION OF THE PLAN

Each phase of the campaign is divided into moves, which are decisions
that are appropriately made together at specific times.

Moves, which are specific to the plan, evoke operations and force
orders, which are not necessarily plan-specific.
```

---

[3]Phasing of the campaign is controlled by the top-level function of the plan, Plan-AFCENT1.

[4]Each AWP begins with a lengthy comment giving the purpose, strategy, coordinating instructions, etc. of the plan in military terms.

[5]These are values of a declared variable Objective of JCS.

```
The plan and its components consists of text, enclosed in brackets ([,
]), and RAND-ABEL executable code.  Text describing the purpose and
strategy of the plan appears above.  Following this text, describing the
organization of the plan, there is the RAND-ABEL code that controls
execution of the phases.  Following that, there is text and code for
each phase and move.  The text and code for operations and force orders
are in a separate file, SOP (standard operating procedures).

Text describing each phase includes its objective(s), assumed threat,
assumed friendly forces, concept of operations, and planned
contingencies.[6]
]

Owner: Blue.

[*****************************************************************]

Define Plan-AFCENT1:[7]

    Perform Sleep-and-wake-immediately.

    Perform AFCENT1-deterrence-phase.[8]
    Perform AFCENT1-defense-phase.
    Perform AFCENT1-nuclear-phase.
    Perform AFCENT1-post-nuclear-phase.
    Perform AFCENT1-termination-phase.[9]

End.
```

AFCENT1-deterrence-phase[10]

The sequence of deterrence phase actions is flow charted in Fig. 15.

```
OBJECTIVES

Deter Warsaw Pact attack and be prepared to defend the NATO Central
Region if attacked.

ASSUMED THREAT

Deleted

ASSUMED FRIENDLY FORCES

Deleted
```

[6]Some of which has been deleted from this Note for reasons of classification.

[7]All RAND-ABEL names, whether they be for functions, variables, or variable values, must not contain blanks; hyphens are generally used to connect parts of names, as in Plan-AFCENT1.

[8]The names of such plan-specific functions include the plan name in the function name, as in AFCENT1-deterrence-phase.

[9]None of the AWPs developed to date have anything but the barest of termination phases.

[10]The deterrence phase involves force deployment and axis prioritization.

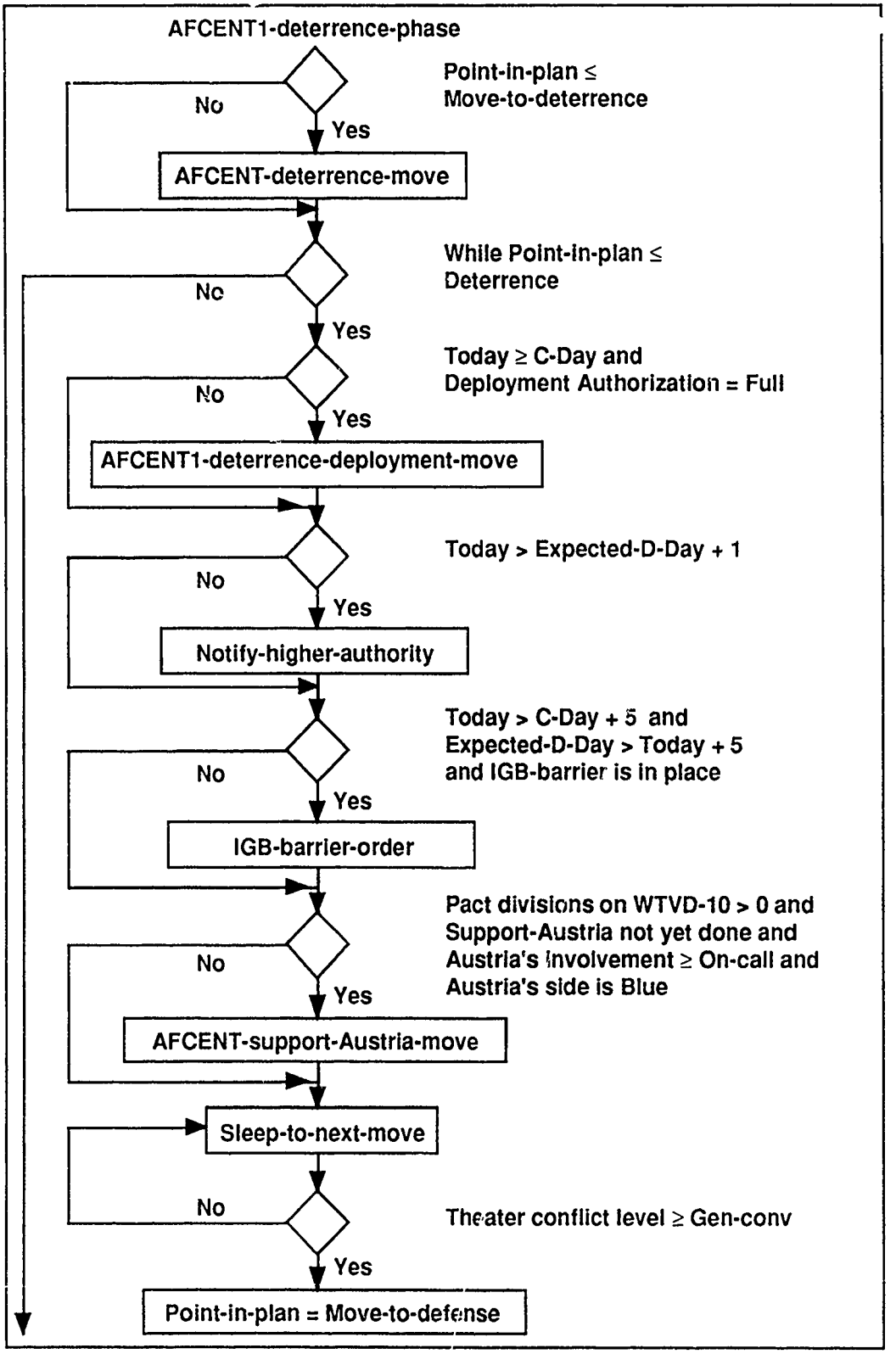

Fig. 15--AFCENT1 flowchart of deterrence phase

```
CONCEPT OF OPERATIONS

NATO forces rapidly mobilize and deploy to GDP positions.  Barrier
preparation at the IGB is ordered if there is enough time prior to
expected D-Day.

PLANNED CONTINGENCIES

If D-Day appears imminent and the Belgian sector appears subject to a
strong attack, the plan will consider either getting them assistance
from the adjacent sector or committing the reserve division.

If Austria requests it, and the threat appears to justify it, forces
will advance into Austria and prepare defenses near Linz.
Other contingencies deleted.
]

[*****************************************************************]

Define AFCENT1-deterrence-phase:

    If Point-in-plan of AFCENT is at most Move-to-deterrence
    Then Perform AFCENT-deterrence-move.

    While Point-in-plan of AFCENT is at most Deterrence:[11]
    {
     [ Deploy U.S. and Allied forces as they become available ]

     If (Today is at least C-Day of AFCENT)[12]
       and Authorization of Deployment, AFCENT is Full
     Then Perform AFCENT1-deterrence-deployment-move.[13]

     [ Revise expected D-Day ]

     If Today is greater than Expected-D-Day of AFCENT + 1 [day]
     Then Perform Notify-higher-authority using time-limit-expired
       as reason, and revise-expected-D-Day as recommendation.[14]

     [ Start IGB Barrier construction if there appears to be time]
```

[11]The plan then cycles through the While loop, testing for moves that must be performed, sleeping until the next day, waking to test for changing the phase, and then repeating the loop.

[12]Parentheses are required in some RAND-ABEL statements to make the logic unambiguous. For rules governing use of parentheses, see the RAND-ABEL reference manual, listed in the Bibliography.

[13]Much of the domain knowledge in AWPs is expressed in If-Then rules, as in this function, or in decision tables, as we'll see later. Here, if the current game day (Today) is at least C-day for this theater and deployment has been authorized by higher authority (Authorization of Deployment, AFCENT), then the plan performs the AFCENT1-deterrence-deployment-move

[14]This prompts higher authority to reassess when D-Day is expected.

```
    If Today is greater than C-Day of AFCENT + 5 and
      Expected-D-Day of AFCENT is greater than Today + 5 [days][15]
      and Move-done of AFCENT, IGB-barrier is No
    Then Perform IGB-barrier-order.[16]

    If (the report from Ask-force-overlay-data using Divisions as
        data, and WTVD-10 as overlay) > 0
      and Move-done of AFCENT, Support-Austria is No
      and (the report from Ask-green-involvement using Austria as
        country, and CEurope as area is at least On-call)
      and (the report from Ask-green-side using Austria as country,
      and CEUR as area is Blue)
    Then Perform AFCENT-support-Austria-move.


    [ Sleep until 0 hour, tomorrow ]

    Perform Sleep-to-next-move[17] using the function AFCENT-wake-at-
      combat as
      planned-wakeup, and ((Today + 1) * 24) as time-limit.

    [ Check for change of phase ]

    If the report from Ask-force-theater-conflict-level using
      Central-Europe as theater is at least Gen-conv
    Then Let Point-in-plan of AFCENT be Move-to-defense.
    }

End.
```

AFCENT1-deterrence-deployment-move

```
Define AFCENT1-deterrence-deployment-move:


    [ Order the initial deployment of national forces as they commit to
      NATO ]

    Table
    {
    Declare country#       : Let country#        be Type-country.
    Declare move#          : Let move#           be Type-AWP-move.
    Declare order-function#: Let order-function# be address of
                                                 Do-nothing.
```

[15]The assumption here is that tank barriers at the Inner German Border would not be ordered until at least five days after C-Day nor unless D-Day was expected to be at least five days hence. These numbers are illustrative only and can be changed.

[16]Library functions, which are not plan-specific, but which are used by this plan, are in file Src/AWP/Blue/Afcent/library.A.

[17]The function Sleep-to-next-move causes the plan to sleep until either the planned-wakeup condition occurs or the time-limit is reached. Here, the planned-wakeup is inactivated by using the function Never-wake, and the time-limit is set to the next day. The time-limit is in hours, which is why Today + 1 (day) is multiplied by 24.

```
If (the report from Ask-green-involvement using country# as
  country and CEurope as area >= On-call or country# is US)
  and Move-done of AFCENT, move# is No
Then Perform order-function#.
!

country#     move#           order-function#
=========== ============== ====================================.
US           US-deploy       (function US-deploy-to-AFCENT)
UK           UK-deploy       (function UK-deploy-to-AFCENT)
Canada       Canada-deploy   (function Canada-deploy-to-AFCENT)
France       France-deploy   (function France-deploy-to-AFCENT)
FRG          FRG-deploy      (function FRG-deploy-to-AFCENT)
Belgium      Belgium-deploy  (function Belgium-deploy-to-AFCENT)
Netherlands  Nether-deploy   (function Netherlands-deploy-to-AFCENT)
[End Table].[18]


[ Test for missing allies ]

If Today > C-Day of AFCENT + 2 and
  (   Move-done of AFCENT, UK-deploy      is No
   or Move-done of AFCENT, France-deploy  is No
   or Move-done of AFCENT, FRG-deploy     is No
   or Move-done of AFCENT, Belgium-deploy is No
   or Move-done of AFCENT, Nether-deploy  is No )
Then Perform Notify-higher-authority using
  alliance-incohesion as reason, and change-plan as recommendation.

End.
```

AFCENT1-defense-phase

```
[
OBJECTIVES

Defend the NATO Central Region from conventional attack by Warsaw Pact
forces.

ASSUMED THREAT

Deleted.

ASSUMED FRIENDLY FORCES

Deleted.

French forces are assumed available for commitment on M-day from their
peacetime locations.
```

[18]The comment "[End Table]" is a convenient marker for the period it precedes, which is required at the end of every RAND-ABEL table. For tables of more than one row, it is customary to place the period on a separate line, as "[End Table]." so that it does not become lost in subsequent editing.

```
CONCEPT OF OPERATIONS

Deleted.

PLANNED CONTINGENCIES

Deleted.
]

Define AFCENT1-defense-phase:

    If Point-in-plan of AFCENT is Move-to-defense
    Then Perform AFCENT1-forward-defense-move.

    While Point-in-plan of AFCENT is Defense:[19]
    {
     Perform AFCENT-determine-FLOT.

     Perform AFCENT1-deterrence-deployment-move.

     Perform AFCENT-adjust-priority.

     If Today is D-Day of AFCENT + 3
     Then Perform AFCENT1-widen-air-defense-move.

     [ Order defenses along the Ems-Neckar line when the FLOT
       penetrates into any zone containing the Weser-Lech line]

     If Move-done of AFCENT, Ems-neck-barrier is No and
       (FLOT of CEUR-2  > 159 or FLOT of CEUR-3 > 126 or
        FLOT of CEUR-4  > 149 or FLOT of CEUR-5 >  96 or
        FLOT of CEUR-6  >  65 or FLOT of CEUR-7 >  65 or
        FLOT of CEUR-8  > 190 or FLOT of CEUR-9 > 190 or
        FLOT of CEUR-10 > 443)
     Then Perform Ems-Neckar-barrier-order.

     [ Sleep until 0 hour, tomorrow ]

     Perform Sleep-to-next-move using the function
       Test-nuclear-authorization as planned-wakeup, and
       ((Today + 1) * 24) as time-limit.

     [ Check for change of phase ]

     If Authorization of Release, AFCENT is Nuclear
     Then Let Point-in-plan of AFCENT be Move-to-nuclear.

     If Authorization of Termination, AFCENT is not None
     Then Let Point-in-plan of AFCENT be Move-to-termination.
    }
```

[19]The two moves within this phase are the AFCENT1-deterrence-deployment-move, performed on C-day (C-Day of AFCENT) and each day thereafter if authorized, and the AFCENT1-prioritization-order, performed once on D-day - 2 days. Since the plan moves only once each day, the test "If Today is D-Day of AFCENT - 2" will be true only once.

```
End.
```

AFCENT1-forward-defense-move

```
Define AFCENT1-forward-defense-move:

    Perform Notify-higher-authority using under-attack as reason, and
      no-recommendation as recommendation.

    Perform AFCENT-forward-defense-priority-order.

    Perform AFCENT1-forward-defense-order.

    Perform AFCENT-init-forward-air-defense-order.

    Perform Weser-Lech-barrier-order.

    Set D-Day of AFCENT be Today.

    Log-decision "     AFCENT - Defense phase".
    Let Point-in-plan of AFCENT be Defense.

End.
```

AFCENT1-forward-defense-order

```
Define AFCENT1-forward-defense-order:

    Log-decision "     Ordering dispersal of air forces".

    Table Disperse-order[20]
      unit   owner   in-region     %-dispersal
      ====   =====   ===========  ===========.
      Air    all     FRG          5
      Air    all     Belgium      5
      Air    all     Netherlands  5
      Air    all     Denmark      5
      Air    all     UK           5
[End Table].

    If Today < C-Day of AFCENT + 1[21]
    Then
    (
     Log-decision "     NORTHAG delaying vice defending".
     Log-note     "     CENTAG axis mission Defend".
```

---

[20]This disperses 5 percent of aircraft presently in regions shown. Percentage here is illustrative.

[21]That is, if NATO had less than one day to prepare. The "1" here is illustrative. The militarily substantive issue is what is the minimal preparation time necessary to order forces to *hold* at the IGB. Alternatively, one could test on NATO force level or the Pact/NATO force ratio.

```
    Table Axis-mission-order
      axis      mission        start-kms   end-kms   expire-D+
      =======   ============   =========   =======   =========.
      CEUR-2    Defend-delay   0           159       999[22]
      CEUR-3    Defend-delay   0           126       999
      CEUR-4    Defend-delay   0           149       999
      CEUR-5    Defend-delay   0            96       999
      CEUR-6    Defend-delay   0            40       999
[End Table].
    )

    Else Log-decision "      NORTHAG defending".

End.
```

AFCENT1-widen-air-defense-move

```
Define AFCENT1-widen-air-defense-move:

    Perform AFCENT-widen-air-defense-order.

End.
```

AFCENT1-nuclear-phase

```
[
OBJECTIVES

Defend the NATO Central Region from conventional or nuclear attack by
Warsaw Pact forces.

ASSUMED THREAT

As in the conventional phase.  Additionally, Red theater nuclear
forces may be employed.

ASSUMED FRIENDLY FORCES

As in the conventional phase.

CONCEPT OF OPERATIONS

Deleted
]
Define AFCENT1-nuclear-phase:

    If Point-in-plan of AFCENT is Move-to-nuclear
    Then Perform AFCENT1-nuclear-move.

    While Point-in-plan of AFCENT is Nuclear:
    {
     Perform AFCENT-determine-FLOT.

     Perform AFCENT1-deterrence-deployment-move.
```

[22]The value "999" is effectively "infinity."

```
    If Authorization of Nuclear,  AFCENT is Demo-nuc
      and Move-done of AFCENT, Demo-nuc-use is No
    Then Perform AFCENT-demonstrative-nuclear-use-move.

    If Authorization of Nuclear,  AFCENT is at least Limited-nuc
      and Number-of-battlefield-nuclear-strikes < 3
    Then Perform AFCENT-battlefield-nuclear-use-move.

    If Authorization of Nuclear,  AFCENT is Limited-nuc
      and Move-done of AFCENT, Theater-nuclear is No
    Then Perform AFCENT-theater-nuclear-use-move.

    If Authorization of Nuclear,  AFCENT is Massive-nuc
      and Move-done of AFCENT, Massive-military-nuclear is No
    Then Perform AFCENT-massive-military-nuclear-use-move.

    [ Sleep for 12 hours ]

    Perform Sleep-to-next-move using the function Never-wake as
      planned-wakeup, and (Time-in-hours + 12) as time-limit.

    [ Check for change of phase ]

    If Authorization of Termination, AFCENT is not None
    Then Let Point-in-plan of AFCENT be Move-to-termination.

    If Authorization of Release, AFCENT is not Nuclear
    Then Let Point-in-plan of AFCENT be Move-to-post-nuclear.
    }

End.
```

AFCENT1-nuclear-move

```
Define AFCENT1-nuclear-move:

    If Authorization of Dispersal,  AFCENT is Full
    Then Perform AFCENT-nuclear-dispersal-order.

    Log-decision "     AFCENT - Nuclear phase".
    Let Point-in-plan of AFCENT be Nuclear.

End.
```

AFCENT1-post-nuclear-phase

```
Define AFCENT1-post-nuclear-phase:

    If Point-in-plan of AFCENT is Move-to-post-nuclear
    Then Perform AFCENT1-post-nuclear-move.

    While Point-in-plan of AFCENT is Post-nuclear:
    {
     [ Sleep until 0 hour, tomorrow ]
```

```
    Perform Sleep-to-next-move using the function Never-wake as
      planned-wakeup, and ((Today + 1) * 24) as time-limit.

    [ Check for change of phase ]

    If Authorization of Termination, AFCENT is not None
    Then Let Point-in-plan of AFCENT be Move-to-termination.
    }

End.
```

AFCENT1-post-nuclear-move

```
Define AFCENT1-post-nuclear-move:

    Log-decision "     AFCENT - Post-nuclear phase".
    Let Point-in-plan of AFCENT be Post-nuclear.

End.
```

AFCENT1-termination-phase

```
Define AFCENT1-termination-phase:

    If Point-in-plan of AFCENT is Move-to-termination
    Then Perform AFCENT1-termination-move.

    While Plan-is-active:
    {
     Perform Sleep-until-bound-broken.
    }

End.
```

AFCENT1-termination-move

```
Define AFCENT1-termination-move:

    Log-decision "     Termination ordered".

    Perform Notify-higher-authority using termination-in-theater as
     reason and change-plan as recommendation.

    Perform Terminate-order using CEUR as arena.

    Log-decision "     AFCENT - Termination phase".
    Let Point-in-plan of AFCENT be Termination.

End.
```

AFCENT1-lookahead-evaluation

Decision logic for National Command Level models includes provision for "lookaheads," each a game within a game, for the purpose of testing tentatively selected objectives, strategies, etc. The NCL makes assumptions about opponent and other behavior, then has the RSAS run ahead in lookahead mode; it then evaluates results by performing <Command>-lookahead-evaluation functions, such as this one.

```
Define AFCENT1-lookahead-evaluation:

    Declare obj      : Let obj       be Type-operational-objective.
    Declare strin    : Let strin     be Type-stringency.
    Declare criterion: Let criterion be Type-theater-status.
    Declare assess   : Let assess    be Type-theater-status.

    Let obj   be Objective of AFCENT.
    Let strin be Lookahead-stringency of AFCENT.

    Decision Table
      obj             strin / assess                          criterion
      =============== ===== / ============================== =========.
      Pursue          --      (Ground-status of Central-Europe) Very-good
      Restore         High    (Ground-status of Central-Europe) Very-good
      Restore         <High   (Ground-status of Central-Europe) Good
      Hold            --      (Ground-status of Central-Europe) Mixed
      Limit-losses    High    (Ground-status of Central-Europe) Very-good
      Limit-losses    Medium  (Ground-status of Central-Europe) Good
      Limit-losses    Low     (Ground-status of Central-Europe) Mixed
      Limit-US-losses High    (Forces-status of Central-Europe) Very-good
      Limit-US-losses Medium  (Forces-status of Central-Europe) Good
      Limit-US-losses Low     (Forces-status of Central-Europe) Mixed
      Deter           --   (Political-status of Central-Europe) Very-good
      Unspecified     --      (Ground-status of Central-Europe) Good
    [End Table].

    If assess >= criterion
    Then
    {
     Log-note "     AFCENT1 objective met in lookahead".
     Exit reporting objective-met.
    }

    Log-note "     AFCENT1 objective unmet in lookahead".
    Exit reporting objective-unmet.

End.
```

V. JCS1: A BLUE ANALYTIC WAR PLAN FOR GLOBAL DEFENSIVE COORDINATION

This section provides an annotated listing of JCS1. Table 11 summarizes Blue actions by phase.

Table 11

SUMMARY OF BLUE AWP JCS1

Phase	Blue Action
Deterrence	Deterrence move
	Deterrence messages
	Assign lift priority
	Deterrence DEFCON
	Deterrence delegation
	Deterrence announcement response
	Deterrence notification response
Regional combat	Regional combat move
	Regional combat DEFCON
	Regional combat announcement response
	Regional combat notification response
Global combat	Global combat move
	Global combat messages
	Global combat DEFCON
	Global combat announcement response
	Global combat notification response
Nuclear	Nuclear move
	Nuclear messages
	Nuclear DEFCON
	Nuclear deployment
	Nuclear announcement response
	Nuclear notification response
Termination	Termination move
	Termination messages
	Termination DEFCON
	Termination deployment
	Termination delegation
	Termination announcement response
	Termination notification response

Additionally, the plan performs the following actions in conjunction with one or more phases:

- Plan selection (for subordinate Commands)
- Announcement penalty
- Announcement response
- Deployment of forces to theaters

Plan-JCS1

```
Owner: Blue.

Define Plan-JCS1:

    Log-reason Day-and-hour "Commencing execution of plan JCS1".
    Perform Sleep-and-wake-immediately.[1]
    Perform JCS1-plan-selection.

    Perform JCS1-deterrence-phase.[2]
    Perform JCS1-regional-combat-phase.
    Perform JCS1-global-combat-phase.
    Perform JCS1-nuclear-phase.
    Perform JCS1-termination-phase.

End.
```

JCS1-plan-selection[3]

```
Define JCS1-plan-selection:

    Declare esc-guidance : Let esc-guidance be
      Type-military-involvement.[4]
    Declare nato-cohesion: Let nato-cohesion be Type-alliance-criteria.
    Declare strategy     : Let strategy      be Type-ground-strategy.
    Declare orient       : Let orient        be Type-color.
    Declare EUR-plan     : Let EUR-plan      be Type-AWP.[5]
    Declare AFNORTH-plan : Let AFNORTH-plan  be Type-AWP.
    Declare AFCENT-plan  : Let AFCENT-plan   be Type-AWP.
```

---

[1]For technical reasons, this statement must appear in every AWP before executing any subordinate functions. By convention, it generally follows a log statement, "Commencing execution of plan <plan name>."

[2]Each of the phase functions contain logic governing transition to the next phase, if any.

[3]The function JCS1-plan-selection selects and starts the subordinate plans to the coordination plan, according to outside guidance. Since the coordination plan is above its subordinates in the plan hierarchy, whenever it is switched to a new plan all of its subordinates are also killed and must be rechosen. Thus the first step in a coordination plan is to select its subordinate plans, regardless of the phase its predecessor may have been in.

[4]The first statement declares a new variable for use in this function. Because the variable has been declared within a function, it can be used in this function only and has no existence elsewhere in the system.

[5]This variable can take on any of the values of the enumeration Type-AWP, which are the names of the Blue AWPs. Thus the variable AFCENT-plan is given the value of the selected AFCENT plan name, and then used later in the function to start the plan.

```
Declare AFSOUTH-plan : Let AFSOUTH-plan  be Type-AWP.
Declare CENT-plan    : Let CENT-plan     be Type-AWP.
Declare KOREA-plan   : Let KOREA-plan    be Type-AWP.
Declare LANT-plan    : Let LANT-plan     be Type-AWP.
Declare PAC-plan     : Let PAC-plan      be Type-AWP.
Declare SAC-plan     : Let SAC-plan      be Type-AWP.
Declare each-command : Let each-command  be Type-command.


[ Given guidance from the NCA, JCS1 uses the following logic to
  select from among the available plans.  This logic is not used in
  User-generated or Human-player modes, where the analyst provides
  the plan names. ]

If NCL-mode is not User-generated and NCL-mode is not Human-player
Then Perform JCS1-select-plans-from-guidance.[6]

For each-command (EUR or CENT or KOREA or LANT or PAC or SAC):
{
Perform Start-new-plan using (Proposed-plan-name of each-command)
   as name.[7]
}

[ Set Expected-D-Day if it has not been set by the NCL ]

For each-command (AFNORTH or AFCENT or AFSOUTH or CENT or KOREA or
  LANT or PAC or SAC):
{
If Expected-D-Day of each-command is never
   and Proposed-plan-name of each-command is not --
Then Let Expected-D-Day of each-command be 5 [days].
}

[ Perform a global unassignment of all forces once ]

If Move-done of JCS, Unassignment is No
Then Perform JCS-global-unassignment.[8]


[ Assign forces dedicated to each command as plans are chosen ]
```

[6]The variable NCL-mode describes the mode of gaming in which the RSAS is being run. In User-generated and Human-player modes, plans are selected by the user through one of the scenario-generating mechanisms, so the code that selects plans is skipped.

[7]The function Start-new-plans starts the named plan running with its first function. The plan name is always taken from the variable Proposed-plan-name, whether the user or the previous code in this function chose the plan. Following execution of the function, the variable Current-plan-name holds the names of the chosen plans.

[8]Since forces begin the run with default assignments, the plan first unassigns all forces so that it may assign them as subordinate plans are chosen.

```
Table[9]
{
  Declare command              : Let command be Type-command.
  Declare O-plan               : Let O-plan  be Type-AWP.
  Declare assignment-function  : Let assignment-function be the
                                 function Assign-AFCENT-core-forces.

If    Current-plan-name of command > O-plan
  and (   Previous-plan-name of command is --
    or    Previous-plan-name of command is O-plan)
Then Perform assignment-function.
 }

   command  O-plan      assignment-function
   =======  ========    ==================================.
   AFNORTH  AFNORTH0    (function Assign-AFNORTH-core-forces)
   AFCENT   AFCENT0     (function Assign-AFCENT-core-forces)
   AFSOUTH  AFSOUTH0    (function Assign-AFSOUTH-core-forces)
   CENT     CENT0       (function Assign-CENT-core-forces)
   KOREA    KOREA0      (function Assign-KOREA-core-forces)
   LANT     LANT0       (function Assign-LANT-core-forces)
[End Table].


Table[10]
{
Declare force#:  Let force# be Type-swingforce.
Declare truth :  Let truth  be Yes.
Declare arena#:  Let arena# be Type-arena.

  If Swingforce-assignment of force# is -- and truth is Yes
  Then Perform Assign-swingforce using force# as force, and
    arena# as arena.
}
  force#      truth                                      arena#
  ==========  =========================================  =========.
  Centcom     (Current-plan-name of CENT is CENT2)       AG-Iran
  Centcom     (Current-plan-name of AFCENT > AFCENT0)    CEUR
[End Table].

End.
```

JCS1-select-plans-from-guidance[11]

```
[
Given guidance from the NCA, JCS1 uses the following logic to select
from among the available Blue AWPs.
]
```

[9]This table performs the core force assignment function for a Command when the first plan is chosen that is not a peacetime plan (one with name ending with zero).

[10]This table performs the swing force assignment function to assign predefined sets of forces depending on the plans chosen.

[11]The tables in this function must be changed if new AWPs are developed for any subordinate command levels. That is, rows must be added to include the new AWP names.

```
Define JCS1-select-plans-from-guidance:

  Declare esc-guidance : Let esc-guidance  be Type-military-involvement.
  Declare nato-cohesion: Let nato-cohesion be Type-alliance-criteria.
  Declare strategy     : Let strategy      be Type-ground-strategy.
  Declare orient       : Let orient        be Type-color.
  Declare EUR-plan     : Let EUR-plan      be Type-AWP.
  Declare AFNORTH-plan : Let AFNORTH-plan  be Type-AWP.
  Declare AFCENT-plan  : Let AFCENT-plan   be Type-AWP.
  Declare AFSOUTH-plan : Let AFSOUTH-plan  be Type-AWP.
  Declare CENT-plan    : Let CENT-plan     be Type-AWP.
  Declare KOREA-plan   : Let KOREA-plan    be Type-AWP.
  Declare LANT-plan    : Let LANT-plan     be Type-AWP.
  Declare PAC-plan     : Let PAC-plan      be Type-AWP.
  Declare SAC-plan     : Let SAC-plan      be Type-AWP.
  Declare each-command : Let each-command  be Type-command.

    Let esc-guidance be Escalation-guidance of EUR.[12]

    Decision Table[13]
      esc-guidance / EUR-plan
      ============ / ========.
      >None          EUR1      [European Def]
      --             EUR0


    Let strategy be Ground-strategy of AFCENT.
    Let nato-cohesion be Alliance-criteria of AFCENT.

    Decision Table
      nato-
      cohesion  strategy   / AFCENT-plan
      ========  ========== / ================================.
       Cohesive Forward      AFCENT1      [Forward Def]
       Cohesive Fallback     AFCENT2      [Fallback Def]
      <Cohesive --           AFCENT3      [Incohesive Alliance]
       --       Prompt-nuc   AFCENT4      [Prompt Nuclear Def]
       --       --           AFCENT0


    Let esc-guidance be Escalation-guidance of CENT.
    Let orient       be Green's Orientation of Iran.[14]

    Decision Table
      esc-guidance orient / CENT-plan
      ============ ====== / ============================.
      >None        Blue     CENT1 [Persian Gulf Defense]
      --           --       CENT0

[Similar tables for other Commands have been deleted.]
```

[12]Escalation-guidance, as well as Grand-strategy and Alliance-criteria, are set by the NCL.

[13]Since there is only one EUR plan at present, it is chosen in any crisis or war situation.

[14]The Orientation of Iran is an input to Green Agent.

```
    Let Proposed-plan-name of EUR      be EUR-plan     .
    Let Proposed-plan-name of AFNORTH  be AFNORTH-plan.
    Let Proposed-plan-name of AFCENT   be AFCENT-plan  .
    Let Proposed-plan-name of AFSOUTH  be AFSOUTH-plan.
    Let Proposed-plan-name of CENT     be CENT-plan    .
    Let Proposed-plan-name of KOREA    be KOREA-plan   .
    Let Proposed-plan-name of LANT     be LANT-plan    .
    Let Proposed-plan-name of PAC      be PAC-plan     .
    Let Proposed-plan-name of SAC      be SAC-plan     .

End.
```

JCS1-deterrence-phase

```
Define JCS1-deterrence-phase:

    Declare reason-for-move: Let reason-for-move be Type-wakeup-report.


    If Point-in-plan of JCS <= Move-to-deterrence[15]
    Then Perform JCS1-deterrence-move.[16]

    While Point-in-plan of JCS is Deterrence:[17]
    {
     Let reason-for-move[18] be the report from JCS-sleep-to-next-move
       using ((Today + 1) * 24) as time-limit.[19]


     If reason-for-move is time-limit-expired[20]
     Then
     {
         Perform JCS1-deterrence-messages.
         Perform JCS1-deterrence-DEFCON.
         Perform JCS1-theater-deployment.
```

---

[15]The JCS1-deterrence-move function changes Point-in-plan to Deterrence, allowing the While loop below to be entered.

[16]Each phase of a coordination plan has an initial move to be done when the phase is entered the first time.

[17]After the initial move, the phase enters a While loop in which it moves at least once a day. The variable Point-in-plan controls when the phase will be left. The function JCS-sleep-to-next-move puts the plan to sleep for either one day or until one of a number of other conditions are met.

[18]A coordination plan can be awakened at any time to handle received communications or the end of a lookahead. Thus, the sleep function returns a value indicating the reason for the wakeup. That value is assigned to the local variable reason-for-move, and is tested later in phase function. The reason reported back may be that time limit has expired, that an NCA-ordered lookahead has ended, that an announcement from a Green country has been received, that the deadline from a JCS announcement has been reached, that a Green country has taken a desired action, or that a subordinate has notified the JCS of some event.

[19]This causes plan JCS1 to awaken at least daily.

[20]If reason-for-move is time-limit-expired, than the list of daily moves are performed. These are send cables, make changes to DEFCON and mobilization levels, deploy U.S. forces from CONUS, and assign strategic lift.

```
        Perform Implement-mobilization.
        Perform JCS-assign-lift.
    }

    If reason-for-move is lookahead-ends
    Then Perform JCS1-lookahead-evaluation.

    If reason-for-move is announcement-received
    Then Perform JCS1-deterrence-announcement-response.

    If reason-for-move is announced-deadline-expires
    Then Perform JCS1-announcement-penalty.

    If reason-for-move is announced-action-occurs
    Then Perform JCS1-announcement-reward.

    If reason-for-move is notification-received
    Then Perform JCS1-deterrence-notification-response.
    Else Perform Clear-notification-prompt.
    }

End.
```

JCS1-deterrence-move

```
[
It is important here to perform the assignment of forces to SAC before
assignment to LANT.  This is an artifact of the way the orders are
written.[21]

Similarly, assignment of tacair to NORAD should be made after all
others, as all otherwise unassigned tacair is herein assigned to NORAD.
]

Define JCS1-deterrence-move:


    Log-reason "     Deterrence phase".

    Perform JCS1-deterrence-messages.
    Perform JCS1-deterrence-delegation.
    Perform JCS1-theater-deployment.
    Perform Implement-mobilization.
    Perform JCS1-assign-lift-priority.
    Perform JCS-assign-lift.

    Log-decision "     JCS - Deterrence phase".
    Let Point-in-plan of JCS be Deterrence.

End.
```

[21]This is a reminder to the analyst using this AWP. It might also be good to put it in a Log-note statement, which would be written to the log during execution.

JCS1-deterrence-messages

```
Define JCS1-deterrence-messages:

    If Today is C-Day of AFCENT
    Then
    {
     Table  Cable
                                                  home-       other-      other-
       country      side  cooperation    involvement involvement area
       ===========  ====  ============== =========== =========== =====.
       Austria      Blue   Transit        --          --          --
       Belgium      Blue   Combat-basing  On-call     --          --
       Canada       Blue   Transit        On-call     --          --
       France       Blue   Transit        On-call     --          --
       FRG          Blue   Combat-basing  On-call     --          --
       Italy        Blue   Combat-basing  On-call     --          --
       Netherlands  Blue   Combat-basing  On-call     --          --
       Portugal     Blue   Transit        --          --          --
       Spain        Blue   Transit        --          --          --
       UK           Blue   Combat-basing  On-call     --          --
     [End Table].
    }

    If Today is C-Day of KOREA
    Then
    {
     Table  Cable
                                                  home-       other-      other-
       country      side  cooperation    involvement involvement area
       ===========  ===== ============== =========== =========== ======.
       Japan        Blue  Combat-basing  On-call     --          --
       South-Korea  Blue  Combat-basing  On-call     --          --
     [ Taiwan       Blue  Combat-basing  On-call     --          -- ]22
     [End Table].
    }

End.
```

JCS1-assign-lift-priority[23]

```
Define JCS1-assign-lift-priority:

    [ This needs to be made adaptive to situation. ]
```

[22]Here, the default is *not* to ask Taiwan for support; however, by copying this function to an interpreted file and removing the brackets, the Cable would go to Taiwan also. A similar line could be added for the PRC.

[23]Airlift and sealift assignment to theaters is based on need and priority number.

```
    [ Set the priority value for each Blue theater.  The default values
      are 3[24] for CEUR, 2 for FEast (Korea) and Iran, and 1 for all
      others]

    Declare each-theater:          Let each-theater be Type-arena.

    For each-theater[25] (CEUR or FEAST or NEUR or TF-Baltic or AG-Balkan
                  or AG-Turkey or AG-Iran or AG-Pakistan
                  or TF-Iceland or TF-Cuba or AG-Italy or all):
    {
      If      each-theater is CEUR
      Then Let Lift-priority of each-theater be 3.
      Else If ((each-theater is FEAST) or (each-theater is AG-Iran))
      Then Let Lift-priority of each-theater be 2.
      Else [ For all other theaters ]
           Let Lift-priority of each-theater be 1.
    }

End.
```

JCS1-deterrence-DEFCON

```
Define JCS1-deterrence-DEFCON:

    Declare each-command: Let each-command be Type-command.


    For each-command:
    {
     If DEFCON-ordered of each-command is Unspecified[26]
     Then
     {
         Let DEFCON-ordered of each-command be DEFCON-3.
         Log-reason "     " each-command "ordered by JCS to DEFCON-3".
     }
    }

    Perform Implement-DEFCON.

End.
```

JCS1-deterrence-delegation

```
Define JCS1-deterrence-delegation:

    [ Set expected D-Day if not set ]
```

---

[24] "3" is the highest priority.

[25] The "For" statement cycles through each of the specified theaters, setting "each-theater" to each theater in turn.

[26] If the NCA has not specified DEFCON for a subordinate command, this function orders it to DEFCON-3 during deterrence phase. Users might want to change this to higher or lower defaults.

```
    If Expected-D-Day of AFCENT is never
    Then Let Expected-D-Day of AFCENT be (C-Day of AFCENT + 5).[27]

End.
```

JCS1-deterrence-announcement-response

```
Define JCS1-deterrence-announcement-response:

    Declare each-country: Let each-country be Type-country.

    For each-country:
    {
     Let Announcement-pending of each-country, To-Blue be No.[28]
    }

End.
```

JCS1-deterrence-notification-response

```
[
TECHNICAL DESCRIPTION

The notification is acted upon and forwarded to the NCA if required.
First, if the game is in a Blue lookahead, no notifications are
forwarded.  Then the notification is read and specific notifications are
responded to.  If the reason signifies a broken bound and the game is in
a Blue lookahead, then that bound is turned off for the originating
theater.  Then the notification is forwarded if required.
]

Define JCS1-deterrence-notification-response:

    Declare forward-note: Let forward-note be Yes.
    Declare sender      : Let sender       be Type-command.
    Declare reason      : Let reason       be Type-reason.


    Perform Clear-notification-prompt.[29]

    Let sender be the report from Ask-sender-of-current-notification.

    [ Forward all bound-broken and selected other notifications ]

    Let reason be Reason of sender.
```

---

[27]If JCS has not been told when to expect D-day in AFCENT, this function tells AFCENT to expect D-day five days after C-day. Classified versions of this function might express different assumptions.

[28]This AWP ignores announcements from non-superpower countries.

[29]This notifies the sending subordinate AWP that the notification has been responded to.

```
Decision Table
  reason                          /  forward-note
  ==============================  /  ============.
  termination-in-theater             Yes
  plan-completed                     Yes
  <End-of-bound-broken-reasons       Yes
  --                                 No
[End Table]

If Lookahead is Yes and Lookahead-agent is Blue[30]
Then
{
 Let forward-note be No.

 If reason is less than End-of-bound-broken-reasons
 Then Perform Turn-off-bound using reason as reason,
   (Origin of sender) as command.

 If reason is nuclear-weapon-use-bound-broken
   and Authorization of Respond-in-kind, JCS is Full[31]
 Then
 {
     Let Authorization of Nuclear, (Origin of sender) be
        Limited-nuc.

     Log-reason "     JCS authorizes limited nuc use in accordance
         with Full Respond-in-kind authorization".
 }
}

If reason is under-attack
Then
{
 Let D-Day of LANT be Today.
 Let D-Day of PAC  be Today.[32]

 Let Point-in-plan of JCS be Move-to-regional-combat.[33]
}

If reason is under-nuclear-attack
Then
```

[30]In a lookahead, bound violations are ignored, and the JCS is generally given authorization to respond in kind to escalation, in order that the lookahead runs to a conclusion.

[31]Authorization for plans to take many important actions must be specifically granted through this variable. War plans do not set authorizations for themselves. Such authorization comes from the NCL models, from the user, or from one of the scenario-generating aids playing the NCL model. The JCS can set some authorizations if authorized to do so.

[32]In this rule, as written, if any U.S. command is attacked by Red forces, Blue escalates immediately to global war at sea. This is illustrative of how intertheater relationships can be expressed.

[33]This plan moves to its combat phase on receipt of an under-attack notification.

```
    {
    Let D-Day of LANT be Today.[34]
    Let D-Day of PAC  be Today.

    Let Point-in-plan of JCS be Move-to-nuclear.
    }

    If reason is termination-in-theater
      and Origin of sender is AFCENT
    Then Let Point-in-plan of JCS be Move-to-termination.

    If Recommendation of sender is revise-expected-D-Day
    Then
    {
    If reason is time-limit-expired
    Then
    {
        Increase Expected-D-Day of (Origin of sender) by 2 [days].

        Log-reason "  Increasing expected D-Day of" (Origin of sender)
          "by 2 days to" (Expected-D-Day of (Origin of sender) ).
    }

    Else If reason is red-poise[35]
    Then
    {
        Let Expected-D-Day of (Origin of sender) be Today + 2 [days].

        Log-reason "     Setting expected D-Day of" (Origin of sender)
          "to day" (Expected-D-Day of (Origin of sender) ).
    }
    }

    If forward-note is Yes
    Then Perform Forward-notification.

End.
```

JCS1-regional-combat-phase

```
Define JCS1-regional-combat-phase:

    Declare reason-for-move: Let reason-for-move be Type-wakeup-report.


    If Point-in-plan of JCS is Move-to-regional-combat
    Then Perform JCS1-regional-combat-move.

    While Point-in-plan of JCS is Regional-combat:
    {
    Let reason-for-move be the report from JCS-sleep-to-next-move
```

[34]Thus, if U.S. forces anywhere are attacked with nuclear weapons, this is assumed to be D-day in the Atlantic and Pacific.

[35]That is, if Red is poised to attack.

```
      using ((Today + 1) * 24) as time-limit.

    If reason-for-move is time-limit-expired
    Then
    (
        Perform JCS1-regional-combat-DEFCON.
        Perform JCS1-theater-deployment.
        Perform Implement-mobilization.
        Perform JCS-assign-lift.
    )

    If reason-for-move is lookahead-ends
    Then Perform JCS1-lockahead-evaluation.

    If reason-for-move is announcement-received
    Then Perform JCS1-regional-combat-announcement-response.

    If reason-for-move is announced-deadline-expires
    Then Perform JCS1-announcement-penalty.

    If reason-for-move is announced-action-occurs
    Then Perform JCS1-announcement-reward.

    If reason-for-move is notification-received
    Then Perform JCS1-regional-combat-notification-response.
    Else Perform Clear-notification-prompt.
    )

End.
```

JCS1-regional-combat-move

```
Define JCS1-regional-combat-move:


    Log-reason "     Regional combat phase".

    Perform JCS1-regional-combat-messages.

    Perform JCS1-regional-combat-DEFCON.
    Perform JCS1-theater-deployment.
    Perform Implement-mobilization.
    Perform JCS-assign-lift.

    Log-decision "     JCS - Regional Combat phase".
    Let Point-in-plan of JCS be Regional-combat.

End.
```

JCS1-regional-combat-messages

```
Define JCS1-regional-combat-messages:
```

```
Table Cable[36]

  country      side  cooperation    home-        other-       other-
                                    involvement  involvement  area
  ===========  ====  =============  ===========  ===========  ======.
  Iran         Blue  Combat-basing  In-combat    --           --[37]
  Kuwait       Blue  Combat-basing  --           --           --
  Bahrain      Blue  Combat-basing  --           --           --
  Qatar        Blue  Combat-basing  --           --           --
  UAE          Blue  Combat-basing  --           --           --
  Saudi-Arabia Blue  Combat-basing  --           --           --
  Oman         Blue  Combat-basing  --           --           --
  North-Yemen  Blue  Combat-basing  --           --           --
  South-Yemen  Blue  Combat-basing  --           --           --
  Pakistan     Blue  Combat-basing  --           --           --
[End Table]

End.
```

JCS1-regional-combat-announcement-response

```
Define JCS1-regional-combat-announcement-response:

    Declare each-country: Let each-country be Type-country.


    For each-country:
    {
        Let Announcement-pending of each-country, To-Blue be No.
    }


    For each-country:
    {
        If Announced-action of each-country, To-Blue is
          Provide-nuc-defense
        Then
        {
            If Authorization of Delegation,  JCS is not Full
              or Delegated-forces of Strat-nuc-forces, JCS is No
            Then Perform Notify-higher-authority using
              nuc-defense-requested as reason, and
              request-nuclear-authorization as recommendation.
            Else
            {
                If Command-over-region of (Main-region-under-country of
                  (each-country)) is AFCENT
                Then
                {
                  Let Authorization of Nuclear,  AFCENT be Limited-nuc.
                  Let Point-in-plan of JCS be Move-to-nuclear.
                }
```

[36]Other, out-of-area cooperation or involvement could be requested.

[37]This assumes combat is in Iran. If the regional combat were elsewhere, this rule should be revised.

```
                If each-country is France or each-country is UK
                Then
                {
                 Table Cable
                                                      home-    other-
                                                      involve  involve other-
                 country      side cooperation       ment     ment    area
                 ============ ==== ================ ======= ======= ======.
                 each-country Blue Nuclear-release  --       --      --    .
                 }
            }

            Perform Clear-announcement using each-country as
                  country, and To-Blue as channel.
        }
    }

End.
```

JCS1-regional-combat-notification-response

```
Define JCS1-regional-combat-notification-response:

    Declare forward-note: Let forward-note be Yes.
    Declare sender      : Let sender       be Type-command.
    Declare reason      : Let reason       be Type-reason.

    Perform Clear-notification-prompt.

    Let sender be the report from Ask-sender-of-current-notification.


    [ Forward all bound-broken and selected other notifications ]

    Let reason be Reason of sender.

    Decision Table
      reason                       /  forward-note
      =========================    /  ============.
      termination-in-theater          Yes
      plan-completed                  Yes
      <End-of-bound-broken-reasons    Yes
      --                              No
    [End Table].

    If Lookahead is Yes and Lookahead-agent is Blue
    Then
    {
     Let forward-note be No.

     If reason is less than End-of-bound-broken-reasons
     Then Perform Turn-off-bound using reason as reason,
       (Origin of sender) as command.
```

```
    If reason is nuclear-weapon-use-bound-broken
      and Authorization of Respond-in-kind, JCS is Full
    Then
    {
        Let Authorization of Nuclear, (Origin of sender) be
           Limited-nuc.

        Log-reason "     JCS authorizes limited nuc use in
            "accordance with Full Respond-in-kind authorization".
    }
    }

    If reason is under-nuclear-attack
    Then Let Point-in-plan of JCS be Move-to-nuclear.

    If reason is termination-in-theater
      and Origin of sender is AFCENT
    Then Let Point-in-plan of JCS be Move-to-termination.


    If forward-note is Yes
    Then Perform-Forward-notification.

End.
```

JCS1-global-combat-phase

```
Define JCS1-global-combat-phase:

    Declare reason-for-move: Let reason-for-move be Type-wakeup-report.


    If Point-in-plan of JCS is Move-to-global-combat
    Then Perform JCS1-global-combat-move.


    While Point-in-plan of JCS is Global-combat:
    {
    Let reason-for-move be the report from JCS-sleep-to-next-move
        using ((Today + 1 [day]) * 24) as time-limit.


    If reason-for-move is time-limit-expired
    Then
    {
        Perform JCS1-global-combat-DEFCON.[38]
        Perform JCS1-theater-deployment.
        Perform Implement-mobilization.
        Perform JCS-assign-lift.
    }

    If reason-for-move is lookahead-ends
    Then Perform JCS1-lookahead-evaluation.
```

[38]This function is similar to those for previous phases and is not listed for this phase.

```
    If reason-for-move is announcement-received
    Then Perform JCS1-global-combat-announcement-response.[39]

    If reason-for-move is announced-deadline-expires
    Then Perform JCS1-announcement-penalty.

    If reason-for-move is announced-action-occurs
    Then Perform JCS1-announcement-reward.

    If reason-for-move is notification-received
    Then Perform JCS1-global-combat-notification-response.[40]
    Else Perform Clear-notification-prompt.
    }

End.
```

JCS1-global-combat-move

```
Define JCS1-global-combat-move:


    Log-reason "     Global combat phase".

    Perform JCS1-global-combat-messages.[41]

    Perform JCS1-global-combat-DEFCON.
    Perform JCS1-theater-deployment.
    Perform Implement-mobilization.
    Perform JCS-assign-lift.


    [ Recommend implementation of the Joint Emergency Evacuation Plan ]

    If Authorization of Evacuate-cities,  JCS is not Full
    Then Perform Notify-higher-authority using action-request as reason,
      and evacuate-cities-authorization as recommendation.

    If Authorization of Evacuate-cities,  JCS is Full
    Then Perform Joint-Emergency-Evacuation-Plan.

    Log-decision "     JCS - Global Combat phase".
    Let Point-in-plan of JCS be Global-combat.

End.
```

JCS1-nuclear-phase

```
Define JCS1-nuclear-phase:
```

---

[39]This function is similar to those for previous phases and is not listed for this phase.

[40]This function is similar to those for previous phases and is not listed for this phase.

[41]This function is similar to those for previous phases and is not listed for this phase.

```
    Declare reason-for-move: Let reason-for-move be Type-wakeup-report.


    If Point-in-plan of JCS is Move-to-nuclear
    Then Perform JCS1-nuclear-move.

    While Point-in-plan of JCS is Nuclear:
    {
      Let reason-for-move be the report from
        JCS-sleep-to-next-move using ((Today + 1) * 24) as time-limit.


     If reason-for-move is time-limit-expired
     Then
     {
         Perform JCS1-nuclear-DEFCON.[42]
         Perform JCS1-theater-deployment.
         Perform Implement-mobilization.
         Perform JCS-assign-lift.
     }

     If reason-for-move is lookahead-ends
     Then Perform JCS1-lookahead-evaluation.

     If reason-for-move is announcement-received
     Then Perform JCS1-nuclear-announcement-response.

     If reason-for-move is announced-deadline-expires
     Then Perform JCS1-announcement-penalty.

     If reason-for-move is announced-action-occurs
     Then Perform JCS1-announcement-reward.

     If reason-for-move is notification-received
     Then Perform JCS1-nuclear-notification-response.
     Else Perform Clear-notification-prompt.
     }

End.
```

JCS1-nuclear-move

```
Define JCS1-nuclear-move:


    Log-reason "     Nuclear phase".

    Perform JCS1-nuclear-messages.

    If Authorization of Deployment,  JCS is not None
    Then Perform JCS1-nuclear-deployment.
```

[42]This function is defined as a marker for further development.

```
    Perform JCS1-nuclear-DEFCON.
    Perform JCS1-nuclear-delegation.
    Perform JCS1-theater-deployment.
    Perform Implement-mobilization.
    Perform JCS-assign-lift.


    [ Recommend implementation of the Joint Emergency Evacuation Plan ]

    If Authorization of Evacuate-cities,  JCS is not Full
    Then Perform Notify-higher-authority using action-request as reason,
      and evacuate-cities-authorization as recommendation.

    If Authorization of Evacuate-cities,  JCS is Full
    Then Perform Joint-Emergency-Evacuation-Plan.

    Log-decision "     JCS - Nuclear phase".
    Let Point-in-plan of JCS be Nuclear.

End.
```

JCS1-nuclear-messages

```
Define JCS1-nuclear-messages:


  Table  Cable

                                                 home-          other-         other-
  country       side    cooperation              involvement    involvement    area
  ============  =====   ======================   ============   ============   ======.
  Belgium       Blue    Nuclear-release          In-combat      --             --
  Denmark       Blue    Nuclear-release          In-combat      --             --
  France        Blue    Nuclear-release          Nuc-combat     --             --
  FRG           Blue    Nuclear-release          In-combat      --             --
  Netherlands   Blue    Nuclear-release          In-combat      --             --
  UK            Blue    Nuclear-release          Nuc-combat     --             --
  [End Table].
End.
```

JCS1-nuclear-deployment [43]

JCS1-nuclear-delegation [44]

JCS1-nuclear-announcement-response [45]

JCS1-nuclear-notification-response [46]

---

[43] This function is defined as a marker for further development.

[44] This function is defined as a marker for further development.

[45] Similar to previous phases; not listed here.

[46] Similar to previous phases; not listed here.

JCS1-termination-phase

```
Define JCS1-termination-phase:

    Declare reason-for-move: Let reason-for-move be Type-wakeup-report.


    If Point-in-plan of JCS is Move-to-termination
    Then Perform JCS1-termination-move.

    While Point-in-plan of JCS is Termination:
    {
     Let reason-for-move be the report from JCS-sleep-to-next-move
         using never as time-limit.


     If reason-for-move is time-limit-expired
     Then
     {
         Perform JCS1-termination-DEFCON.
         Perform Implement-mobilization.
         Perform JCS-assign-lift.
     }

     If reason-for-move is lookahead-ends
     Then Perform JCS1-lookahead-evaluation.

     If reason-for-move is announcement-received
     Then Perform JCS1-termination-announcement-response.

     If reason-for-move is announced-deadline-expires
     Then Perform JCS1-announcement-penalty.

     If reason-for-move is announced-action-occurs
     Then Perform JCS1-announcement-reward.

     If reason-for-move is notification-received
     Then Perform JCS1-termination-notification-response.
     Else Perform Clear-notification-prompt.
     }

End.
```

JCS1-termination-move

```
Define JCS1-termination-move:


    Log-reason "      Termination phase".

    Perform JCS1-termination-messages.

    If Authorization of Deployment,  JCS is not None
    Then Perform JCS1-termination-deployment.
```

```
    Perform JCS1-termination-DEFCON.
    Perform JCS1-termination-delegation.
    Perform Implement-mobilization.
    Perform JCS-assign-lift.

    Log-decision "     JCS - Termination phase".
    Let Point-in-plan of JCS be Termination.

End.
```

JCS1-termination-messages

```
Define JCS1-termination-messages:


  If Hotline-deadline of Blue-to-Red <= 0 [No previous message pending.]
  Then                                    [Then send message if necessary.]
  {
    If Termination-strategy of JCS is Seek-surrender
    Then
    {
    Table Hotline
      request     reward      penalty           deadline
      =========   ==========  ================  ==================.
      Surrender   Cease-fire  Ultimatum-threat  Ultimatum-deadline.

    [when penalty specified is an escalatory one, it is an ultimatum]
    }

    Else If Termination-strategy of JCS is Tradeoff
    Then
    {
    Table Hotline
    request                    reward     penalty           deadline
    =========================  =========  ================  ========.
     Withdraw-to-your-territory Cease-fire Ultimatum-threat Ultimatum-
                                                           deadline.
    }

    Else If Termination-strategy of JCS is Cease-fire
    Then
    {
    Table Hotline
      request     reward        penalty           deadline
      =========   ============  ================  ==================.
      Cease-fire  Cease-fire    Ultimatum-threat  Ultimatum-deadline.
    }
  }

End.
```

JCS1-termination-DEFCON

```
Define JCS1-termination-DEFCON:
```

```
    Declare each-command: Let each-command be Type-command.


    For each-command:
    {
     If DEFCON-ordered of each-command is Unspecified
     Then
     {
         Let DEFCON-ordered of each-command be DEFCON-5.
         Log-reason "    " each-command "ordered by JCS to DEFCON-5".
     }
    }

    Perform Implement-DEFCON.
End.
```

JCS1-termination-deployment [47]

JCS1-termination-delegation [48]

JCS1-termination-announcement-response [49]

JCS1-termination-notification-response [50]

JCS1-announcement-penalty[51]

JCS1-announcement-reward

JCS1-lookahead-evaluation

```
[
TECHNICAL DESCRIPTION

If no bounds are broken in any theater and AFCENT reports success, then
report a successful lookahead.  Otherwise, report failure.
]

Define JCS1-lookahead-evaluation:

    Declare obj    : Let obj     be Type-operational-objective.
    Declare key-cmd: Let key-cmd be Type-command.
    Declare lookahead-func:
     Let lookahead-func be the function AFCENT1-lookahead-evaluation.
```

[47]This function is defined as a marker for further development.
[48]This function is defined as a marker for further development.
[49]Similar to previous phases; not listed here.
[50]Similar to previous phases; not listed here.
[51]This and the remainder of the JCS1 functions are common to all phases.

```
  [ Perform Assess-current-situation. ]

    Let obj be Objective of JCS.

    Decision Table
      obj                      / key-cmd
      ======================== / =======.
      Destroy-Soviet-Union       SAC
      Defeat-Red-worldwide       AFCENT
      Defeat-Pact                AFCENT
      Defend-alliances           AFCENT
      Limit-coalition-losses     AFCENT
      Limit-US-losses            AFCENT
      Support-allies             AFCENT
      Unspecified                AFCENT
    [End Table].

    Let lookahead-func be Lookahead-function of key-cmd.

    If the report from lookahead-func is objective-met
    Then Perform Notify-higher-authority using lookahead-evaluation as
      reason and accept-plan as recommendation.

    Else Perform Notify-higher-authority using lookahead-evaluation as
      reason and reject-plan as recommendation.

End.
```

JCS1-theater-deployment

```
Define JCS1-theater-deployment:


    [ Order the initial deployment of national forces as they commit to
      NATO ]

    Table
    (
    Declare country#        : Let country#        be Type-country.
    Declare command#        : Let command#        be Type-command.
    Declare order-function#: Let order-function# be function
        Do-nothing.

    If the report from Ask-green-cooperation using country# as country
       is at least Combat-basing
      and Move-done[52] of command#, JCS-deploy is No
      and Today is at least C-Day of command#
```

[52]Many moves within a phase, such as the committing of specific reserve forces, should only be performed once during a phase. Because of the looping structure of the phase, the conditions for each move are tested every day. For these moves, a test such as the one above is added to their conditions for performance. Within the move, the same Move-done element is set to Yes, indicating that the move has been performed. Thereafter, the conditions for that move will never occur.

```
    Then Perform order-function#.
    }

      country#      command#   order-function#
      ==========    ========   ==================================.
      Norway        AFNORTH    (function JCS1-deploy-AFNORTH-forces)
      FRG           AFCENT     (function JCS1-deploy-AFCENT-troops)
      Greece        AFSOUTH    (function JCS1-deploy-AFSOUTH-forces)
      Iran          CENT       (function JCS1-deploy-CENT-forces)
    [End Table].


    If Today is at least C-Day of AFCENT
    Then Perform JCS1-deploy-AFCENT-tacair.

End.
```

JCS1-deploy-AFCENT-troops

```
Define JCS1-deploy-AFCENT-troops:


    Log-reason "     Deploying troops to EUCOM from CONUS.".

    Table Deploy-by-name-order
      unit-name              owner   destination  means
      ====================   ======  ===========  ==========.
     [ List of units and deployment destinations]
    [End Table].

    Let Move-done of AFCENT, JCS-deploy be Yes.

End.
```

JCS1-deploy-AFCENT-tacair

```
Define JCS1-deploy-AFCENT-tacair:

    Declare total-deployed: Let total-deployed be 1.

    Let total-deployed be 0.

    Table
    {
     Declare index       : Let index       be 1.
     Declare command     : Let command     be Type-command.
     Declare mob-required: Let mob-required be Yes.
     Declare unit        : Let unit        be "string".
     Declare destination : Let destination be Type-region.

     If    JCS-squadron-deployed of index is No
       and total-deployed < JCS-number-of-squadrons-deployed-per-day
       and (Today > C-Day of command)
       and (mob-required is No or Today > M-Day of command)
       and (   Today > D-Day of command
```

```
        or JCS-number-of-squadrons-deployed of command <
      JCS-max-squadrons-deployed-before-D-day of command)
  Then
  (
      Perform Deploy-by-name-order using unit as unit-name,
        US as owner, (Evaluate destination) as destination, and "-"
          as means.

      Increase total-deployed by 1.
      Increase JCS-number-of-squadrons-deployed of command by 1.

      Let JCS-squadron-deployed of index be Yes.

      Log-decision "     Deploying " unit " to" destination.
  )
  )
                    mob-
    index  command  required  unit                 destination
    =====  =======  ========  ==================  ===========.
  [ List of units and deployment destinations in order of
  deployment][53]
  [End Table].

End.
```

JCS1-deploy-AFSOUTH-forces

```
Define JCS1-deploy-AFSOUTH-forces:

    Log-reason "     Deploying forces to AFSOUTH from CONUS.".

    Table Deploy-by-name-order
      unit-name  owner   destination  means
      =========  ======  ===========  ===========.
     [ List of units and deployment destinations]
    [End Table].

    Let Move-done of AFSOUTH, JCS-deploy be Yes.

End.
```

JCS1-deploy-AFNORTH-forces

```
Define JCS1-deploy-AFNORTH-forces:

    Log-reason "     Deploying forces to AFNORTH from CONUS.".
```

[53]The classified version of this function lists units by name.

```
    Table Deploy-by-name-order
      unit-name              owner   destination       means
      ====================   ======  ================  ===========.
     [ List of units and deployment destinations]
    [End Table].

    Let Move-done of AFNORTH, JCS-deploy be Yes.

End.
```

JCS1-deploy-CENT-forces

```
Define JCS1-deploy-CENT-forces:

    Log-reason "     Deploying forces to CENT from CONUS.".

    Table Deploy-by-name-order
      unit-name                owner   destination          means
      =======================  ======  ===================  ===========.
     [ List of units and deployment destinations]
    [End Table].

    If Swingforce-assignment of Centcom is AG-Iran[54]
    Then
    {
     Table Deploy-by-name-order
       unit-name   owner   destination     means
       ==========  ======  ==============  ===========.
     [ List of units and deployment destinations]
     [End Table].
    }
    Else
    {
     Log-decision "     Swingforces for CENT unavailable for AG-Iran".
     Log-decision "     Swingforces sent to " (Swingforce-assignment of
         Centcom).
    }

    Let Move-done of CENT, JCS-deploy be Yes.

End.
```

[54]This tests whether the CENCOM package of forces, assigned in the function JCS1-plan-selection, has been assigned to the theater AG-Iran before deploying those forces.

VI. RAND-ABEL FORCE ORDERS

Summary

AWPs and Control Plans contain many orders written as RAND-ABEL force order tables. These tables are executable RAND-ABEL code and must be correctly formatted. This section describes and specifies the format of each type of order table.

The RAND-ABEL force order tables are actually calls to lower-level utility functions which translate the table entries into CAMPAIGN, Referee[1] and Flag model[2] orders. Most RSAS users will have no need to examine, much less change, these utility functions.[3]

These orders are arranged alphabetically, to facilitate reference to them. An example and a brief description of the use and effects of each order is given. Where the order is to the CAMPAIGN model, the name of the corresponding CAMPAIGN order generated is given. Actions set in the Flag model are also given.

Table 12 lists the RAND-ABEL orders grouped by category. The Owner column gives the declared owner of the function when it is not Global. Orders owned only by Red or Blue should be used only by those agents. Orders owned by both Red and Blue have a slightly different format for each. Orders owned by Referee affect combat in alternate theaters and must have their ownership indicated by the word "Referee's" before the order name (as shown in the examples). This points out the difference between orders to the main theater and alternate theater combat models, which are largely similar in format.

Table 13 gives the meaning and allowed values for the parameters (or column headings) of the orders, most of which are used in more than one order. Where the value is an enumeration (a name beginning with the word "Type"), the values are listed in Section XI.

---

[1]Referee is used to adjudicate outcomes in theaters modeled by the CAMPAIGN-ALT (sometimes referred to as S-LAND) force model.

[2]The Flag model manipulates "flag" or "marker" variables, indicating status set directly by rules, without being generated by a process simulation model.

[3]These functions are located in directories Src/Interface/to-Force-C for CAMPAIGN orders, Src/Interface/to-Force-A for Referee, and Src/Force-A/Abel-force for the Flag model.

Table 12

RAND-ABEL FORCE ORDERS

Orders	Owner (if not Global)
Assigning Forces to Theaters	
Assign-air-army-order	Red
Assign-by-name-order	Red, Blue
Assign-naval-order	
Assign-order	Red, Blue
Alerting Forces	
Alert-air-army-order	Red
Alert-by-name-order	
Alert-order	Red, Blue
Mobilizing Forces	
Mobilize-order	Red, Blue
Mobilize-by-name-order	
Deploying Forces	
Deploy-order	Red, Blue
Deploy-air-order	
Deploy-ground-order	
Deploy-ground-to-km-order	
Deploy mine-countermeasures-order	
Deploy-naval-order	
Deploy-by-name-order	
Dispersing Forces	
Disperse-against-nuclear-use-order	
Disperse-order	
Beginning and Ending Combat	
Attack-order	
Terminate-order	
Arena-attack-order	Referee
Arena-terminate-order	Referee
Air Combat Guidance	
Apportion-Fighter-order	Red, Blue
Apportion-Fbomber-order	Red
Apportion-Interdictor-order	Blue
Apportion-Mbomber-order	Red, Blue
Apportion-Multi-order	Red, Blue
Allocate-CAS-BAI-order	
Air-plan-order	
Strike-order	
Delegate-air-order	
Define-laydown-order	
Cover-area-order	
Cover-barrier-order	

Table 12

RAND-ABEL FORCE ORDERS (CONT'D)

Orders	Owner (if not Global)
Air Combat Guidance cont'd	
Air-apportionment-order	Referee
Air-command-guidance	Referee
Air-commander-guidance	Referee
Attack-target-priority-order	Referee
BAI-axis-allocation-order	Referee
CAS-axis-allocation-order	Referee
Ground Combat Guidance	
Axis-envelope-order	
Axis-mission-order	
Axis-thrust-order	
Gnd-force-envelope-order	
OCL-on-off-order	
Position-order	
Build-defense-order	
Gnd-force-mission-order	
Axis-position-order	Referee
Axis-priority-order	Referee
Ground-aggressiveness-order	Referee
Operation-order	Referee
Point-axis-mission-order	Referee
Naval Combat Guidance	
Engage-order	
Strike-order	
Task-order	
Minelay-order	
Strategic Nuclear Execution	
Execute-order	
Launch-order	
3rd Country Postures	
Ally-order	Green
Control-order	Green
Cooperate-order	Green
Restrict-combat-order	Green
Generic Orders	
Initiate-action-order	
Terminate-action-order	
Send-force-order	
Delay-orders	
Miscellaneous	
Sabotage-order	
Jamming-order	

Table 13

PARAMETERS IN RAND-ABEL FORCE ORDERS

Parameter	Meaning	Legal Values
action	Action being ordered	Type-action
actor	Government issuing the order	Type-color
AD%	Percentage of sorties apportioned to air defense (interception of penetrators)	0-100
AF%	Percentage of sorties apportioned to defense of airbases against enemy OCA	0-100
aggressiveness	Aggressiveness of ground forces	Type-3-range
AI%	Percentage of sorties apportioned to air interdiction mission	0-100
AI-AF%	Percentage of sorties apportioned to air interdiction against airfields	0-100
AI-OTH%	Percentage of sorties apportioned to air interdiction against targets other than airfields	0-100
air-air	Air-to-air posture	Type-air-air-posture
air-arena	CAMPAIGN-ALT theater of air combat	Type-air-arena
air-army	Soviet air army	Type-air-army
aircraft	Type of aircraft	Any aircraft in enumeration Type-theater-force
air-gnd	Air-to-ground posture	Type-air-gnd-posture
allocate	Activate CAMPAIGN-ALT air commander model to allocate	Yes/No
apportion	Activate CAMPAIGN-ALT air commander model to apportion	Yes/No
Ar%	Percentage of sorties apportioned to area defense against enemy AI	0-100
arena	Element of military geography identifying the combat theater and side	Type-arena
at-govt	Government being targeted	Type-country
atk-target	Target of attack mission sorties	Type-attack-target-priority
at-speed	Speed of naval deployment	Type-naval-speed
Att%	Percentage of sorties apportioned to attack against airborne command and control	0-100
Attack%	Percentage of sorties apportioned to attack	0-100
auth	Type of weapon authorized	Type-warhead
axis	Element of military geography identifying the axis and side	Type-axis
BAI%	Percentage of sorties apportioned to battle area interdiction of ground forces	0-100
CAS%	Percentage of sorties apportioned to close air support	0-100

Table 13

PARAMETERS IN RAND-ABEL FORCE ORDERS (CONT'D)

Variable	Meaning	Legal Values
command	Military command (e.g., CINC)	Type-command
cover-region	Region to be covered by MPA	Type-region
cover-region1	A region on one side of a barrier	Type-region
cover-region2	A region on one side of a barrier	Type-region
Cov%	Percentage of sorties apportioned to defense of direct support penetrators	0-100
days-close	Number of days to use in closing pincers	Positive integer
days-mopup	Number of days to use to mopup following closing pincers maneuver	Nonnegative integer
DCA%	Percentage of sorties apportioned to defensive counter air mission	0-100
defense-level	Level of defensive barriers constructed	Type-defense-level
DefSup%	Percentage of sorties apportioned to defense suppression	0-100
depth	Depth in kilometers	Nonnegative number
dest-axis	Destination axis for an envelopment	Type-overlay
DS%	Percentage of sorties apportioned to direct support against reserve forces	0-100
DS CAS%	Percentage of sorties apportioned to direct support against forces on the FLOT	0-100
duration	Duration of ordered action in hours	Nonnegative number
end-kms	Position in kilometers from initial FLOT to which the order is to be in effect	A number
enter-pincer	Axis from which an envelopment begins	Type-overlay
expire-D+	Day after D-day when order ceases to be in effect	Positive integer
Esc%	Percentage of sorties apportioned to escort of deep (AI and Other Plan) penetrators	0-100
Escort%	Percentage of sorties apportioned to escort	0-100
force	Force being ordered	A string
frequency	Communications band	Type-frequency
from-force	Force from which units are to be drawn	A string
gnd-support	Priority given to ground support	Type-ground-support-priority
govt	Government	Type-country
group	Addressable group of combat aircraft	Type-apportionable-group
high-axis	Higher-numbered axis acting as a pincer	Type-overlay
high-axis-start-kms	Position in kilometers from initial FLOT from which the order is to be in effect	A number
high-lowtech	High or low technology weaponry	Type-high-low
hours-delay	Delay for issuance of subsequent orders to CAMPAIGN	Nonnegative number

Table 13

PARAMETERS IN RAND-ABEL FORCE ORDERS (CONT'D)

Parameter	Meaning	Legal Values
in-overlay	Present overlay of forces to which the order applies	Type-overlay
in-region	Present location of forces to which the order applies	Type-region
insertion	Method of insertion of forces	Type-insertion
kms	Kilometers	A number
laydown	Targeting plan weapons laydown	A string, which must be recognized by CAMPAIGN
level	Level	Type-level
low-axis	Lower-numbered axis acting as a pincer	Type-overlay
low-axis-start-kms	Position in kilometers from initial FLOT from which the order is to be in effect	A number
method	Launch method	Type-launch-method
mission	Mission assigned to force	Type-allocatable-resource (aircraft),Type-axis-mission (ground forces),Type-operation-mission (Operation-order and other Referee orders) or Type (Gnd-force-mission-order)
name	A name, as in the name of a weapons laydown	A string
NR%	Percentage of sorties apportioned to nuclear reserve	0-100
OCA%	Percentage of sorties apportioned to offensive counterair	0-100
OCA-DSUP%	Percentage of sorties apportioned to defense suppression	0-100
OCL	Operational command level	Type-OCL
on-off	On or off	Type-on-or-off
option	Name of an option	A string (Air-plan-order) or Type-plan-option (Recall-execution-order)
order	A CAMPAIGN order	A string of legitimate CAMPAIGN orders
owner	Country owning the force being ordered	Type-country
pct	Percent	0-100
permit-deny	Level of cooperation by a Green country with its superpower ally	Type-permit-deny
plan	Name of list of targets for theater air or strategic weapons	Type-air-plan (Air-plan-order) or a string (Execute-order)
priority	Priority for POMCUS deployment	Negative number

Table 13

PARAMETERS IN RAND-ABEL FORCE ORDERS (CONT'D)

Parameter	Meaning	Legal Values
QRA%	Percentage of sorties apportioned as quick reaction aircraft	0-100
qty	Quantity	Any positive integer
right	Right permitted or denied by a Green country	Type-right
rule	Rule of Engagement	Type-ROE
Sec%	Percentage of sorties apportioned to corridor-security and escort missions	0-100
side	Side (Red, Blue, or White)	Type-color
start	Starting point, in kilometers	Nonnegative number
start-kms	Position in kilometers from initial FLOT from which the order is to be in effect	A number
tactic	Tactic to be used	Type-axis-tactic
target	A CAMPAIGN-MT target class or a CAMPAIGN-ALT point axis target	A string or a value in enumeration Type-pt-axis-target
task	Naval task assigned to force	Type-ship-task
thru-region	Way-point through which forces are ordered to deploy	Type region
thrust	Level of effort of attack on a given axis	Type-axis-thrust
to-arena	Destination to which forces are ordered	Type-arena
to-axis	Axis to which forces are ordered	Type-overlay
to-command	Command to which forces are ordered	Type-command
to-force	Force to which forces are ordered	A string, which must be recognized by CAMPAIGN
to-kms	Destination on an axis, measured in kilometers from initial border	A number
to-overlay	Overlay to which forces are ordered	Type-overlay
to-region	Region to which forces are ordered	Type-region
unit	Unit being ordered	Type-unit
unit-name	Name of specific military unit	A string, which must be recognized by CAMPAIGN
weapon	Weapon to be used	A string
zone	CAMPAIGN-MT zone	Positive number
#-%	Indicator of whether a quantity is the absolute number (#) or a percentage (%) of those available	# or %
#-pincers	Number of pincers in an encirclement maneuver	Positive integer
%-axis	Percentage applicable to specified axis	0-100
%-dispersal	Percentage of forces to be dispersed	0-100
%-ready	Level of readiness to be achieved	0-100

Air-apportionment-order

```
Table Referee's Air-apportionment-order
  air-arena    aircraft  CAS%  BAI%  Attack%  Escort%  DCA%
  ==========   ========  ====  ====  =======  =======  ====.
  N-Cape-air   Air-air    0     0      0        50       50  .
```

This apportions aircraft from an alternate theater air-arena to each of the allowed missions. The percentages will be normalized to 100 if they sum to greater than 100, while a total percentage of less than 100 will withhold some aircraft. Sorties generated must still be allocated to targets, using the CAS-axis-allocate-order, BAI-axis-allocate-order, and Attack-target-priority-order.

Missions	Target	Flown by
CAS	Close Air Support	Multi, SR-air-gnd
BAI	Battlefield Air Interdiction	Multi, SR/MR/LR-air-gnd
Attack	Deep interdiction	Multi, MR/LR-air-gnd
Escort	Escort for attack sorties	Multi, Air-air
DCA	Defensive Counter Air	Multi, Air-air

Air-commander-guidance

```
Table Referee's Air-commander-guidance
air-arena  apportion air-air   air-gnd   allocate atk-target gnd-support
========== ========= ========= ========= ======== ========= ===========.
N-Cape-air Yes       Defensive Mid-range Yes      Air       Weighted    .
```

This activates (or deactivates) and gives guidance to the Referee Air Commander model, which apportions aircraft to missions and allocates sorties to targets from alternate theater air-arenas. The columns apportion and allocate control whether the model will make apportionment or allocation decisions, or both. When active, the model will override any Referee apportion or allocate orders given. The following tables describe the allowed values of guidance.

air-air	Meaning
Offensive	Attempt to attain air superiority in the theater
Mixed	Perform a combination of offensive and defensive missions
Defensive	Deny enemy air incursions into friendly territory

air-gnd	Meaning
Deep	Perform all air-to-ground missions, including deep attack
Mid-range	CAS and BAI preferred, but selected deep targets possible
Shallow	Only CAS and BAI missions are allowed

atk-target	Meaning
Air	Airfields
Naval	Ports and amphibious landings
Ground-net	Landchoke points and moving ground forces
Logistics	Supplies, stockpiles, and lift
Political	Enemy capital
Other	User specified
Equal	All targets

gnd-support	Meaning
Priority	OAS sorties divided among high priority axes
Weighted	OAS sorties allocated according to perceived need
Equal	OAS sorties divided equally among axes

Air-plan-order

```
Table Air-plan-order
  arena  plan  laydown
  =====  ====  ========================================.
  CEUR   OCA   "GDR OCA-2 30% Conv  Poland OCA-4 10% Conv".
```

This allows the redefinition of the targeted bombing plans of a main theater. These plans are associated with missions to which aircraft can be apportioned. The laydown string consists of a list of specific laydowns to be flown, giving for each the target region, specific laydown name, percentage of aircraft on the laydown, and their load (conventional or nuclear). See the CAMPAIGN Plan order documentation for the list of specific laydowns and their effects. Laydowns may also be defined using the Define-laydown-order. Aircraft are apportioned to these plans through the Apportion orders and fly against the targets each day.

The CAMPAIGN Plan order is generated.[4] The available plans and components can be seen by entering the CAMPAIGN orders:

Display plan . . .

Display plan laydown . . . ..

[4]For example: Order Blue Plan CEUR OCA . . . .

Blue Plans	Red Plans	Comment
AI	AI	Air Interdiction
OCA	Other	Offensive Counter Air
Non-thtr	AirArmy	Delegated aircraft (Blue carrier, Red air army)

Alert-order

```
Table Alert-order
  unit     owner  command  arena  in-region  %-ready
  ======   =====  =======  =====  =========  =======.
  Air      US     AFCENT   CEUR   FRG        100
  Multi    all    AFNORTH  all    Norway      80     .
```

This changes the ordered alert level of air, ICBM and SSBN units, which gives the percentage of the unit that is combat ready. Units typically can raise their alert level by several percent per hour. An ordered alert level of 0 completely withholds the unit. If arena is all, orders are generated for all arenas under that command.

Use the Task order for attack submarines and Mobilize-order for ground units. Use the Launch-order to put aircraft on airborne alert.

This generates the CAMPAIGN Alert order. In the Flag model, the Alert action is set after 12 hours.

Alert-air-army-order (Red)

```
Table Alert-air-army-order
  unit     owner  air-army     in-region  %-ready
  ======   =====  ==========   =========  =======.
  Tacair   USSR   Legnica-AA   all        100     .
```

This changes the ordered alert level of air-army units. See the Alert-order for details. No flag is set.

Alert-by-name-order

```
Table Alert-by-name-order
  unit-name  owner  %-ready
  =========  =====  =======.
  "1st-TFW"  US     100     .
```

This changes the ordered alert level of the named unit. See the Alert-order for details. No flag is set.

Allocate-CAS-BAI-order

```
Table Allocate-CAS-BAI-order
  mission   àrena    %-axis#1   #2   #3   #4   #5   #6   #7   #8   #9   #10
  =======   ======   ========   ==   ==   ==   ==   ==   ==   ==   ==   ===.
  CAS       CEUR           10   10   10   10   10   10   10   10   10   10 .
```

This allocates the percentage of CAS or BAI sorties in a main theater to be flown in each axis. Percentages that do not total 100 will be normalized to 100. If the Korean main theater or a sub-theater (such as CEUR-A) is given, then only the axes that fall in that theater will be considered, and the percentages will be normalized over those axes.

The CAMPAIGN Allocate order is generated. The CAMPAIGN misc display shows the current allocation.

Ally-order

```
Table Green's Ally-order
  govt   side
  ====   ====.
  UK     Blue.
```

This changes the alliance of a country between Blue, Red, or White. A country's alliance indicates only the side to which it may grant control of its forces. Allying by itself does not give control, but canceling an alliance cancels any control given. A side of White is unallied. This order is generally used only by Green Agent, according to the decided value of Green's Side of a country.

The CAMPAIGN Side order is generated. The CAMPAIGN govt display gives the current ally of a country. The Data Editor tableau set "Green/control-green.T", tableau "Global Political-Military Situation" gives the current value of Side.

Apportion-Fbomber-order (Red)

```
Table Apportion-Fbomber-order
  group   arena   AI-AF%   AI-OTH%   DefSup%   DS%   DS-CAS%   NR%
  =====   =====   ======   =======   =======   ===   =======   ===.
  USSR    WTVD        50        50        50     5        50    50.
```

This apportions fighter-bomber aircraft to missions in a main theater, or a sub-theater of a main theater. Separate apportionments may be made to USSR, allied, and air-

army air groups. The mission percentages are normalized to sum to 100, unless they total 0.

The CAMPAIGN Apportion order is generated. The CAMPAIGN misc display shows the current apportionment.

Apportion-Fighter-order (Blue)

```
Table Apportion-Fighter-order
  group  arena  Esc%  AD%
  =====  =====  ====  ===.
  US     CEUR    50    50.
```

This apportions fighter aircraft to missions in a main theater, or a sub-theater of a main theater. Separate apportionments may be made to US, allied, and carrier air groups. The mission percentages are normalized to sum to 100, unless they total 0.

The CAMPAIGN Apportion order is generated. The CAMPAIGN misc display shows the current apportionment.

Apportion-Fighter-order (Red)

```
Table Apportion-Fighter-order
  group  arena  Esc%  Sec%  Att%  Cov%  AF%  A.%
  =====  =====  ====  ====  ====  ====  ===  ===.
  USSR   WTVD     50    50     0     0    0    0.
```

This apportions fighter aircraft to missions in a main theater, or a sub-theater of a main theater. Separate apportionments may be made to USSR, allied, and air-army air groups. The mission percentages are normalized to sum to 100, unless they total 0.

The CAMPAIGN Apportion order is generated. The CAMPAIGN misc display shows the current apportionment.

Apportion-Interdictor-order (Blue)

```
Table Apportion-Interdictor-order
  group  arena  OCA%  AI%  OCA-DSUP%  BAI%  CAS%  QRA%
  =====  =====  ====  ===  =========  ====  ====  ====.
  US     CEUR      0   50          0     0    50     0.
```

This apportions interdictor aircraft to missions in a main theater, or a sub-theater of a main theater. Separate apportionments may be made to US, allied, and carrier air groups. The mission percentages are normalized to sum to 100, unless they total 0.

The CAMPAIGN Apportion order is generated. The CAMPAIGN misc display shows the current apportionment.

Apportion-Mbomber-order (Blue)

```
Table Apportion-Mbomber-order
  group   arena   OCA%   AI%   QRA%
  =====   =====   ====   ===   ====.
  US      CEUR       0    50     50.
```

This apportions medium bomber aircraft to missions in a main theater, or a sub-theater of a main theater. Separate apportionments may be made to US, allied, and carrier air groups. The mission percentages are normalized to sum to 100, unless they total .0.

The CAMPAIGN Apportion order is generated. The CAMPAIGN misc display shows the current apportionment.

Apportion-Mbomber-order (Red)

```
Table Apportion-Mbomber-order
  group   arena   AI-AF%   AI-OTH%   NR%
  =====   =====   ======   =======   ===.
  USSR    WTVD        50        50    50.
```

This apportions fighter aircraft to missions in a main theater, or a sub-theater of a main theater. Separate apportionments may be made to USSR, allied, and air-army groups. The mission percentages are normalized to sum to 100, unless they total 0.

The CAMPAIGN Apportion order is generated. The CAMPAIGN misc display shows the current apportionment.

Apportion-Multi-order (Blue)

```
Table Apportion-Multi-order
  group   arena   OCA%   AI%   OCA-DSUP%   BAI%   CAS%   QRA%   AD%
  =====   =====   ====   ===   =========   ====   ====   ====   ===.
  US      CEUR       0    50           0      0     50      0     0.
```

This apportions fighter aircraft to missions in a main theater, or a sub-theater of a main theater. Separate apportionments may be made to US, allied, and carrier air groups. The mission percentages are normalized to sum to 100, unless they total 0.

The CAMPAIGN Apportion order is generated. The CAMPAIGN misc display shows the current apportionment.

Apportion-Multi-order (Red)

```
Table Apportion-Multi-order
  group  arena  AI-AF%  AI-OTH%  DefSup%  DS%  DS-CAS%  NR%  AF%  Ar%
  =====  =====  ======  =======  =======  ===  =======  ===  ===  ===.
  USSR   WTVD       50       50       50    5       50   50    0    0.
```

This apportions fighter aircraft to missions in a main theater, or a sub-theater of a main theater. Separate apportionments may be made to USSR, allied, and air-army groups. The mission percentages are normalized to sum to 100, unless they total 0.

The CAMPAIGN Apportion order is generated. The CAMPAIGN misc display shows the current apportionment.

Arena-attack-order

```
Table Referee's Arena-attack-order
  arena
  =====.
  NEUR .
```

This orders the forces in a given alternate theater to attack, starting ground, air, and coastal combat. The Referee adjudication model for the arena will not run until this attack order is given. The side of the arena given specifies the side attacking.

Arena-terminate-order

```
Table Referee's Arena-terminate-order
  arena
  =====.
  NEUR .
```

This stops combat in a given alternate theater. Giving either the Blue or Red arena stops combat for both. The Referee adjudication model for the arena will no longer be run.

Assign-order

```
Table Assign-order
  qty  #-%  unit    owner  in-region  to-command  to-arena
  ===  ===  ======  =====  =========  ==========  =========.
   80  %    Troops  FRG    FRG        AFCENT      CEUR
    2  #    Armor   FRG    FRG        AFNORTH     TF-Baltic.
```

This assigns currently unassigned ground, air, missile, and lift forces to an arena. Ground and missile forces are not affected other than to tag them for reference by the assign columns of other orders. Air forces will fly in support of their assigned arena if in range. The percent of airlift or sealift assigned to an arena is reserved to move forces there. (JCS and SHC plans automatically generate lift assignment orders each day as required.)

in the column #-% causes qty to be interpreted as a number of units; % causes it to be interpreted as a percentage of the total pool of selected forces available at the beginning of that move. (This differs from the CAMPAIGN Assign order, in which each subsequent order refers to a percentage of the shrinking pool of assigned forces.) If arena (in "to-arena") is "all" a default assignment is made to the main arena under that command. More ready and more powerful forces are selected for assignment first when more than one force is available to be chosen.

The CAMPAIGN Assign order is generated. The CAMPAIGN air, ground, or unit displays will show force assignments.

Assign-air-army-order (Red)

```
Table Assign-air-army-order
  qty  #-%  unit    owner  in-region  to-air-army
  ===  ===  ======  =====  =========  ===========.
  100  %    Troops  GDR    GDR        Legnica-AA .
```

This assigns currently unassigned air forces to an air army. Air armies must be delegated to an arena through the Delegate-order. See the Assign-order for the interpretation of qty.

The CAMPAIGN Assign order is generated.

Assign-by-name-order

```
Table Assign-by-name-order
  unit-name          to-command to-arena
  ================== ========== =========.
  "1-MARDIV/1-REGT"  AFNORTH    NEUR      .
```

This assigns a named, unassigned force to an arena. See the Assign-order for details.

Assign-naval-order

```
Table Assign-naval-order
  force       to-force
  ==========  ==========.
  "BCG.70_1"  "BCG.70_2".
```

This reassigns a vessel or task group to a task group. Task groups assigned to other task groups will participate in any deployment orders given to the parent group. Do not reassign SSBNs.

The CAMPAIGN Assign order is generated.

Attack-target-priority-order

```
Table Referee's Attack-target-priority-order
  from-air-arena  priority  axis            target    sorties
  ==============  ========  ==============  ========  =======.
  Kola-air        1         R-Kirkeness-21  Airfield  10
  Kola-air        2         R-Oslo-34       Airfield  30      .
```

This allocates Attack sorties from an alternate theater air-arena to a list of targets. Missions are flown against targets in the priority order listed, beginning with priority 1. A proportionate amount of the Escort sorties generated in the same air-arena are flown with each mission. Targets in the list are skipped if they are destroyed or in a country for which a withhold has been set, through variable Specific-target-withhold.

Attack-order

```
Table Attack-order
  arena
  =====.
  CEUR .
```

This causes the specified main theater to attack, starting ground and air combat. Ground forces with default destinations in the arena will automatically deploy. Forces owned by invaded countries will fight whether or not they have given control to a side. A Position-order for the attacking forces that is greater than 0 must also be given for ground forces to attack.

The CAMPAIGN Attack order is generated. The following flags are raised in the main region of the arena: Conventional-warfare after 6 hours, Mobilization after 6 hours, Alert after 3 hours, Deployment after 24 hours, Poising after 3 hours.

Axis-envelop-order

```
Table Axis-envelop-order
            low-axis-           high-axis-  #-       days- days-  expire-
  low-axis  start-kms high-axis start-kms   pincers  close mopup  D+
  ========  ========= ========= ========== ======= ===== ===== =======.
  CEUR-4    50        CEUR-6    50         2       5     3     10      .
```

This gives envelopment missions to one or two axes for the CAMPAIGN Ground Commander Model in a main theater. As it is guidance to the model, the model must be turned on for the arena using the OCL-on-off-order. Specific ground units must also be given envelopment missions (Gnd-force-envelop-order). This methodology is experimental and the user should refer to CAMPAIGN documentation for further details.

The CAMPAIGN Mission order is generated.

Axis-mission-order

```
Table Axis-mission-order
  axis    mission  start-kms  end-kms  expire-D+
  ======  =======  =========  =======  =========.
  CEUR-4  Defend   0          1000     999      .
```

This gives special missions to axes for the CAMPAIGN Ground Commander model in a main theater. As it is guidance to the model, the model must be turned on for

the arena using the OCL-on-off-order. Missions in general specify the tactic for the forces on the axis while the FLOT is between the km bounds specified, until the expiration day specified.

The CAMPAIGN Mission order is generated.

Mission	Meaning
Withdraw	Withdraw to the rear bound
Delay	Delay to the rear bound
Defend	Never attack to regain lost territory
Defend-delay	Defend while in prepared positions, delay if forced into hasty defense
Defend-withdraw	Defend while in prepared positions, withdraw if forced into hasty defenses
Pin-attack	Perform pinning attacks, but follow if the enemy falls back
Support-attack	Attack towards ordered position, but do not attempt a breakthrough
Main-attack	Attack towards ordered position, attempting breakthrough
Cancel	Cancel queued missions except envelopments and withdrawals

Axis-position-order

```
Table Referee's Axis-position-order
  axis      kms
  =======   ====.
  NWTVD-1   1000.
```

This sets the ground objective for forces on a LOC axis in an alternate theater, measured in kms down the length of the axis. Forces on an axis will strive to move the FLOT to reach their ground objective and stop. Combat will not occur unless the attacking side is given a position ahead of the current FLOT position. An axis given a position behind the current FLOT position will always withdraw.

Axis-tactic-order

```
Table Referee's Axis-tactic-order
  tactic  axis
  ======  =======.
  Attack  NWTVD-1.
```

This sets the combat tactic for forces on a LOC axis in an alternate theater. One side must choose an attacking tactic for FLOT movement to occur. If both choose defending tactics a static battle will result.

Tactic	Meaning
Defend	Do not advance unless the enemy withdraws
Delay	Defend, trading increased FLOT movement for lower losses
Attack	Advance to ordered position
Pin	Attack with lowered loss rates, do not advance

Axis-thrust-order

```
Table Axis-thrust-order
  axis     thrust
  ======   ===========.
  CEUR-4   Main-effort.
```

This sets the priority of axes for reinforcement and supply in a main theater. This is guidance to the CAMPAIGN Ground Commander Model, so that model must also be turned on for the arena using the OCL-on-off-order.

This sets the CAMPAIGN thrust parameter in the OCL table.

BAI-axis-allocation-order

```
Table Referee's BAI-axis-allocation-order
  from-air-arena pct  axis
  ==============  ===  ======.
  Kola-air        25   NWTVD-1.
```

This allocates the total Battlefield Air Interdiction sorties generated in an alternate theater air-arena among alternate theater LOC and point axes. Blue plans allocate to blue axis names. Percentages across the entire arena will be normalized to 100 if greater than 100.

Build-defense-order

```
Table Build-defense-order
  axis     zone  start  depth  defense-level
  ======   ====  =====  =====  =============.
  CEUR-4   3.05  0      7      Prepared      .
```

This starts the building of Prepared or Fortified defenses in main theater zones, subject to build rates and the availability of resources. Construction begins the specified start distance in kms from the end of the zone closest to the enemy, but not farther forward than the ordered position of the building forces or the location of the enemy. Areas of ordered defenses cannot overlap on the same axis.

This sets the CAMPAIGN parameters fortified and prepared in the zone table. The CAMPAIGN barrier display shows constructed barriers.

CAS-axis-allocation-order

```
Table Referee's CAS-axis-allocation-order
  from-air-arena  pct  axis
  ==============  ===  =======.
  Kola-air        25   NWTVD-1.
```

This allocates the total Close Air Support sorties generated in an alternate theater air-arena among alternate theater LOC and point axes. Blue plans allocate to blue axis names. Percentages across the entire arena will be normalized to 100 if greater than 100.

Control-order

```
Table Green's Control-order
  govt  side
  ====  ====.
  UK    Blue.
```

This gives control of a country's forces to Red or Blue. Forces owned by third countries will not be affected by orders issued by Red or Blue until that country has granted control. A side of White gives control back to the owning country, but will not withdraw forces from combat. Control may not be granted to a side that is not the ally of the country (see the Ally-order). This order is generally used only by Green Agent, according to the decided value of Green's Involvement of a country in its theater of interest. An involvement of On-call or greater causes control to be granted.

The CAMPAIGN Control order is generated. The CAMPAIGN govt display gives the current control of a country. The Data Editor tableau set "Green/control-green.T", tableau "Global Political-Military Situation" gives the current value of Involvement.

Cooperate-order

```
Table Green's Cooperate-order
  govt  permit-deny  right
  ----  -----------  =======.
  UK    Permit       Overfly.
```

This sets the level of cooperation of a country with its ally. Orders that violate the set permissions of a country will be rejected. By default, all rights are denied to the allies of all nations except for nations with peacetime basing of foreign forces, who grant Overfly, Transit, and Basing. This order is generally used only by Green Agent, according to the decided value of Green's Cooperation level of a country with its ally.

The CAMPAIGN Permit or Deny order is generated. The CAMPAIGN govt display gives the current granted permissions of a country. The Data Editor tableau set "Green/control-green.T", tableau "Global Political-Military Situation" gives the current value of Cooperation.

Cover-area-order

```
Table Cover-area-order
  pct  unit  owner  arena  in-region  cover-region
  ===  ====  =====  =====  =========  ============.
  100  MPA   US     all    Norway     Norwegian-Sea.
```

This specifies levels of effort for MPA (Maritime Patrol Aircraft), AWACs, or interceptors in on-station coverage in a region. MPA may only cover sea regions or choke points. They follow the ROEs (Rules of Engagement) for the region. Orders given for forces in the same region must all use specific owners (UK, US) or all use "all." The two types may not be mixed. Combat permission must be granted by a third country before MPA may fly cover from that country, although the order will be accepted and remembered.

The CAMPAIGN Cover order is generated. The CAMPAIGN mpa-cover displays show the cover orders given to MPA.

Cover-barrier-order

```
Table Cover-barrier-order
  pct  unit   owner   arena  in-region  cover-region1  cover-region2
  ===  =====  ======  =====  =========  =============  =============.
  100  Multi  Norway  all    Norway     Norway         Finland       .
```

This specifies levels of effort for AWACs or interceptors in on-station coverage between two regions. MPA may not cover barriers. The barrier is the border between the two cover-regions. Orders given for forces in the same region must all use specific owners (UK, US) or all use "all." The two types may not be mixed.

The CAMPAIGN Cover order is generated.

Define-laydown-order

```
Table Define-laydown-order
  name        target
  =========   ========================.
  "leaders"   "PLDR-natl primary 100%".
```

This allows the definition of new sets of targeting instructions (laydowns) which can be used by the Air-plan and Strike-orders. The target parameter is a single string that forms a list of targets. A target consists of a target class (defined in CAMPAIGN documentation), a targeting site option (primary/alternate/relocation/other), and a percentage of warheads on that target. The name of a laydown defined through this order can be used in the laydown columns of other orders. Laydown names previously defined in CAMPAIGN may be redefined through this order, excepting laydowns associated with SIOP/RISOPs.[5]

The CAMPAIGN Laydown order is generated.

Delegate-air-order

```
Table Delegate-air-order
  pct   unit      from-force     to-arena
  ===   =======   ============   ========.
  100   Fighter   "NIMITZ"       NEUR
  100   Fighter   "Legnica-AA"   NWTVD    .
```

This orders carrier or air army aircraft to fly in support of an arena.

Task group names here affect only the flagship. Air only flies when in a region in range of the arena, as specified in the database file Force-C/D/theater.sec.

The CAMPAIGN Delegate order is generated. The CAMPAIGN delegate display shows current delegations.

---

[5]Care must be taken in attempting to redefine a laydown. It may be impossible to delete a target from a previously defined laydown. Because of automatic normalization of percentages, results may not be those intended.

Delay-hours

```
Table Delay-hours
  hours-delay
  ===========.
  1          .
```

This delays the effect of all subsequent orders to the CAMPAIGN model. The delay is automatically set to 0 when any AWP ends its move.

Deploy-order

```
Table Deploy-order
                                                    in-     in-       to-     to-
  qty #-%  unit    owner  command  arena  in-      region  overlay   region  overlay
  === ===  ======  =====  =======  =====  region    ======  =======   ======  =======.
  100 %    Troops  UK     AFCENT   CEUR   UK        --      --        FRG     --      .
```

This allows the deployment of forces from a region or overlay to a region or overlay. Aircraft may only be deployed from region to region. Deployment starts both mobilization and training. Troops deploying to an overlay are automatically assigned to that arena. Deployment to an axis is to the current FLOT. Units currently in-transit will not be affected. Units move by their default method of locomotion. Distances between regions are calculated from region-center to center. Ground units within a main theater move between zones, and in an alternate theater between points. Required air and sealift must be assigned through the Assign-order. Basing permission must be granted before a a deployment order to a third country will be accepted.

"All" in both to- columns deploys forces to their default destinations (given only in the ground.sec database file). # in the column #-% causes qty to be interpreted as a number of units. % causes its interpretation as a percentage of the total pool of selected forces available at the beginning of that move (this differs from the Camper Deploy order, in which each subsequent order refers to a percentage of the shrinking pool of undeployed forces). If command is specified but arena is "all" and #-% is %, then similar orders are generated for all arenas under that command, as given by the array Command-over-arena. If #-% is # then the order is given for the main arena only.

The CAMPAIGN Deploy order is generated. The Deployment flag is raised after 48 hours in the to-region, or the region under to-overlay as given by the array Region-under-overlay. No flags in regions are set if "all" is given.

Deploy-by-name-order

```
Table Deploy-by-name-order
  unit-name       owner destination   means
  ==============  ===== ============  ===============.
  "2nd-Div     "  US    CEUR-B        "-"             .
```

This is similar to the Deploy order, but specific military units are named.

Deploy-mine-countermeasures-order

```
Table Deploy-mine-countermeasures-order
  qty  owner  to-region
  ===  =====  =========.
  5    Blue   GI-Gap    .
```

This orders the deployment of a number of mine countermeasure assets to a sea choke region. The allowed values of owner are Blue and Red. MCM assets are not played as physical entities, but only as a number for each choke region that is incremented by this order. Each asset clears a number of square-kms per day of mines.

The CAMPAIGN mcm-deploy parameter in the choke table is generated. The CAMPAIGN mine display shows counts of MCM assets.

Deploy-naval-order

```
Table Deploy-naval-order
  force          thru-region   lat-lon   to-region      at-speed
  ============   ============  ========  =============  =========.
  "BCG.NIMITZ"   --            "51E45N"  Norwegian-Sea  Taskforce.
```

This deploys naval taskgroups or single vessels to a sea region, sea choke region, coastal land region, or specific lat/lon. If a taskgroup is named, all vessels in the taskgroup, wherever they are, deploy as ordered. If a single vessel is named, only that vessel deploys. "Thru-region" may specify an intermediate region through which the vessels must pass in order to more precisely specify their route. "At-speed" may be Taskforce, Max-taskforce, or Flankspeed (all vessels make their best speed). Do not deploy submarines, which deploy according to the Task-order. Deployment to a land region orders the vessels to port. Only one port is specified for each region.

The CAMPAIGN Deploy order is generated.

Disperse-order

```
Table Disperse-order
  unit     owner  in-region  %-dispersal
  ======   =====  =========  ===========.
  Troops   US     FRG        50          .
```

This orders ground forces to disperse out of casemes, air forces to disperse to dispersal bases, and nuclear weapons to disperse from storage sites. "Unit" can be any unit type under Troops, Air, or Lift, or the individual types Lift, Civil (US/USSR only), or Leadership.

The CAMPAIGN Disperse order is generated. Leadership affects only the Flag model. If in-region is all, the flag is set in all regions containing any equivalent divisions (EDs) of the appropriate color.[6] The following flags are set after 6 hours: if unit is Leadership--Leadership-dispersal; if unit is Civil--City-evacuation; otherwise--Dispersal.

Disperse-against-nuclear-use-order

```
Table Disperse-against-nuclear-use-order
  unit     owner  in-overlay  %-dispersal
  ======   =====  ==========  ===========.
  Troops   US     CEUR-1      50          .
```

This orders ground forces in a main theater to operate in nuclear-scared posture. The CAMPAIGN Disperse order is generated.

Engage-order

```
Table Engage-order
  region    rule    auth
  =======   ======  ====.
  Barents   Attack  Conv.
```

This sets the naval rules of engagement in sea and choke regions. Authorization of Nuc releases nuclear weapons for use (but not for SSBNs). The default ROE is Defend. ASW begins immediately when the ROE in a region is Attack, but the Strike-order must be used to attack with air or missiles.

---

[6]An ED is a measure of ground force fire power roughly equivalent to that of a modern armored division.

The CAMPAIGN Engage order is generated. The CAMPAIGN engage-rule display shows the ROE for all sea regions.

Rule	Meaning
Withdraw	Do not return fire under any circumstances
Defend	Do not initiate combat
Trail	Close with enemy but do not initiate combat
Exclude	Initiate combat if the enemy is Trail
Attack	Seek out and attack any enemy in the region

Execute-order

```
Table Execute-order
  owner  arena  plan     option  hrs-delay
  =====  =====  ======   ======  =========.
  all    CEUR   "SIOP"   "OMT"   0         .
```

This executes SIOP/RISOP strategic nuclear plan options. Execution messages are transmitted to forces via the C3 models. Missile and bomber forces will execute only those weapons systems which are generated (Alert-order). SSBNs that cannot immediately launch due to ranging considerations will reroute and launch when they come within range of targets.

The CAMPAIGN Execute order is generated.

Gnd-force-mission-order

```
Table Gnd-force-mission-order
  unit-name    owner  mission  axis    kms  expire-D+
  ==========   =====  =======  ======  ===  =========.
  "1st-Inf"    US     Dig-in   CEUR-1  99   999
```

This gives special missions to ground forces in a main theater. A force with a mission will not be deployed by the Ground Commander Model for axis reinforcement.

The CAMPAIGN Mission order is generated.

Mission	Meaning
Air-drop	Air-drop an airborne force at the time given for expire-D+
Air-assault	Air-land an airmobile force at the time given for expire-D+
Dig-in	Deploy to the position specified and prepare deliberate defenses
Omg	Deploy to the specified axis and prepare for insertion as an OMG
Cancel	Cancel all missions that have not yet been initiated

Gnd-force-envelope-order

```
Table Gnd-force-envelope-order
  unit-name   owner  enter-pincer  dest-axis  expire-D+
  ==========  =====  ============  =========  =========.
  "1st-Inf"   US     CEUR-1        CEUR-2     6         .
```

This orders a ground force to support an ordered envelopment in a main theater An envelopment must also be ordered using the Axis-envelope-order. The force will deploy immediately to the pincer axis specified, and if the planned envelopment is initiated, take up blocking positions in the rear of the enemy axis specified.

The CAMPAIGN Mission order is generated.

Ground-aggressiveness-order

```
Table Referee's Ground-aggressiveness-order
  aggressiveness  arena
  ==============  =====.
  High            NWTVD.
```

This sets the aggressiveness of ground forces in an alternate theater. Aggressiveness affects the force ratio required to attack and multiplies the defender loss rate, exchange rate, and FLOT movement rate.

Initiate-action-order

```
Table Initiate-action-order
  actor  action    region  delay          duration
  =====  ========  ======  ============   ========.
  Red    Blockade  GDR     6.0 [hours]    never    .
```

This is the order to the Flag Model to set a flag, or action, in the given region to signal the given action of the given actor. "Delay" gives the number of hours until the action will begin. "Duration" gives the number of hours that the action will be in progress. Many other force orders use this order to set flags in the Flag Model representing their effects.

Jamming-order

```
Table Jamming-order
  in-region  frequency  on-off
  =========  =========  ======.
  USSR-West  VLF        On     .
```

This initiates jamming of communications facilities. Once activated, jamming will continue until the jammer is destroyed or turned off. Only the fixed jammers at known facilities can be activated.

The CAMPAIGN Initiate order is generated. The Jamming flag is set after 3 hours. If in-region is "all," flags are set in all regions containing EDs of the appropriate side.

Launch-order

```
Table Launch-order
  unit  in-region  method
  ====  =========  ======.
  C3    Hawaii     Flush .
```

This orders the flush or launch of a sustaining force of heavy bombers, tankers, or C3 aircraft. Only US and USSR owned aircraft may be launched. The flush option launches all aircraft currently alerted. If either Hbomber or Tanker is selected, both tankers and bombers are flushed. Either the C3- or H-bomber-launch flag is set after 3 hours. If in-region is "all," flags are set in all US/USSR regions.

The CAMPAIGN Launch order is generated. See CAMPAIGN documentation for explanation of assumptions and methodology involved.

Minelay-order

```
Table Minelay-order
  qty  owner  high-lowtech  in-region
  ===  =====  ============  =========.
  500  Blue   High          GI-Gap    .
```

This lays a quantity of mines in the given sea choke region. Allowed values of owner are Blue and Red. Mines attack only enemy ships. No minelaying assets are

explicitly played. This order only increments a number of mines in each choke region. Mines deliver an expected level of damage to each ship passing through the choke.

The CAMPAIGN mine-lay parameter of the choke table is generated. The CAMPAIGN mine display shows the mines that have been laid.

Mobilize-by-name-order

```
Table Mobilize-by-name-order

unit-name        owner     %-ready
=========        =====     =======.
"1st-Inf"        US        100     .
```

This mobilizes the named unit. See the Mobilize-order for general details.

Mobilize-order

```
Table Mobilize-order
  unit     owner  command   arena   in-region   %-ready
  ======   =====  =======   =====   =========   =======.
  Troops   all    AFCENT    CEUR    FRG         80      .
```

This orders mobilization of ground forces or strategic lift. Forces will not deploy until 100% mobilized. Mobilization also causes ground forces to begin training. If arena is "all," orders are given for all arenas under that command.

The CAMPAIGN Mobilize order is generated. The Mobilization flag is set after 24 hours. If in-region is "all," flags are set in all regions containing EDs of the appropriate side.

OCL-on-off-order

```
Table OCL-on-off-order
  arena   OCL      on-off
  =====   ======   ======.
  CEUR    Air      On     .
```

This turns On or Off the Operational Command Level (OCL) models for main theaters for Ground or Air, by arena. The air and ground OCLs (Air Commander and Ground Commander) make daily apportionment and reinforcement decisions.

The on or off parameters of the OCL table are set in CAMPAIGN. The OCL table contains other OCL guidance parameters. The CAMPAIGN misc display shows current model guidance.

Operation-order

```
Table Referee's Operation-order
  operation qty unit-name  mission  arena  target   to-axis   insertion
  ========= === ========== =======  =====  =======  ========  =========.
  Regular   0.3 "1st-Amph" Occupy   NWTVD  Seaport  NWTVD-21  Heliborne.
```

This orders one of several types of operations against a LOC or point axis in an alternate theater. If the operation is Regular (meaning regular forces are used) then qty is the size in divisions of the unit, used for calculating lift requirements. "unit-name" is required only for Regular operations, and should otherwise be the null string, "". Blue plans refer to Blue arenas and axes.

Operation	Insertion	Meaning
UCW	In-place/Air/Sea	Unconventional Warfare teams
Chemical	SSM/Air	Chemical strikes
Nuclear	SSM/Air	Nuclear strikes
Regular	Air/Sea/Heliborne	Air, amphibious, helicopter assaults

Point-axis-mission-order

```
Table Referee's Point-axis-mission-order
  mission  axis
  =======  ========.
  Occupy   NWTVD-21.
```

This changes the mission of forces at an alternate theater point axis. Ground forces may be occupying, denying, or dispersed about a point. A target will be damaged by denying forces even if there is no enemy present. Dispersal represents forces dispersing in guerilla groups around the point and forces a static, minimal intensity battle. All points have a default mission of Occupy. Forces arriving at a target through the Operation-order have the mission of the point set as part of the order.

Poise-order

```
Table Poise-order
  arena
  =====.
  CEUR .
```

This removes any existing peacetime restrictions on barrier construction or force posturing before combat occurs in a main theater. These restrictions are lifted automatically when an attack order is given.

The CAMPAIGN Poise order is generated. The Poising flag is set after 6 hours in the main region of the arena.

Position-order

```
Table Position-order
  axis     kms
  ======   ===.
  CEUR-1   10 .
```

This sets the ground objective on an axis in a main theater. Forces will not advance past their ordered position, and if forward of a newly ordered position will withdraw. Distances are measured in kilometers from peacetime positions. Positive values are in Blue's territory, negative in Red's.

The CAMPAIGN Position order is generated. The CAMPAIGN misc display shows the current ordered positions.

Recall-launch-order

```
Table Recall-launch-order
  unit
  ====.
  C3   .
```

This recalls forces that have been launched through the Launch-order. Recalling Hbombers will recall tankers but recalling C3 will not. Because C3 tanking is only nominally modelled, this will have no effect on C3 sustainability.

The CAMPAIGN Recall order is generated.

Recall-execution-order

```
Table Recall-execution-order
  option
  ======.
  CF     .
```

This recalls the execution of strategic forces. When used to cancel an execution EAM, the recall order will check all SSBNs and missile forces, as well as all bombers on the ground. Currently, the model will not attempt to recall bombers already airborne with an execute order. Note also that cancelling an option will not cause PCL bombers carrying weapons for that option to return. A separate recall order is required. The recall order is useful for cancelling delayed executions, as well as for cancelling firing missions for SSBNs who must transit to reach their firing positions. The recall order will not, in general, work for non-delayed executions, since forces will have already executed before the recall arrives.

The CAMPAIGN Recall order is generated.

Restrict-combat-order

```
Table Green's Restrict-combat-order
  govt   permit-deny   area   arena   axis
  ====   ===========   ====   =====   ======.
  UK     Deny          --     CEUR    all    .
```

This restricts where national ground forces can be employed in a main theater. Permission or denial in an arena affects all axes in that arena, hence only one of the arena and axis columns should be filled for each table line. These restrictions apply only to the Ground Commander Model. Explicit Deploy-orders are not restricted. This order is generally used only by Green Agent.

The CAMPAIGN Permit or Deny order is generated.

Sabotage-order

```
Table Sabotage-order
  in-region  laydown      level
  =========  ===========  =======.
  USSR-W     "Transport"  Partial.
```

This initiates sabotage activities. "In-region" may not be owned by the saboteur or any of its allies. Only laydowns with C3 target classes will have effect in CAMPAIGN.

The CAMPAIGN Initiate order is generated. Leadership, Transport, and Communications are the only laydowns recognized by the Flag model. These will set the corresponding Leadership-sabotage, Transport-sabotage, and Comm-sabotage flags after 6 hours.

Send-force-order

```
Table Send-force-order
  order
  ========================.
  "set airwar ceur bai-arty 0.25".
```

This sends an order string as written to CAMPAIGN. This is used to give any orders for which a RAND-ABEL order has not been written; for instance, the setting of most parameters. It can also be used instead of the RAND-ABEL form of the order.

The string must be written exactly as it would appear in a Force "use" file. The proper format can be determined by consulting on-line or hardcopy Force documention or, most reliably, by entering the order into Force interactively, to ensure that it "takes" and produces the desired results, and observing the result in the RSAS output ".com" file in the Run/O directory. In those cases, the .com file form should be copied into the Send-force-order.

Strike-order

```
Table Strike-order
  unit-name              weapon    qty  at-govt target
  ====================== ======= ==== ======= ==========================.
  "Nucarty CEUR-1"       ""          5   --      ""
  "Nimitz          "     "TAIR"      5   GDR     "MAIR-major main GDR"
  "1st-TFS         "     "runway"    5   GDR     "OCA1 GDR"
  "MX US-Nplcins US"     "nuc"       5   GDR     "1st-Armd"
  "F-111 UU US     "     "pgm"       5   GDR     "THTR-cas CEUR-1"
```

This orders a one-time conventional or nuclear attack against varied enemy assets.

"Unit-name" may be either a specific unit name or a force type. Only alert forces can be used for strikes. If an airforce wing is specified, the unit in the wing with the greatest range is selected. Units cannot be on a mission or enroute. Only air units capable of interdiction, BAI, multi, deepstrike and bomber missions may be used for

strikes. Missiles on naval vessels can only be selected by vessel name, and vessels must be at sea. If a force type is specified, unit-name must also contain the location of the force and the government currently controlling the force, in that order. Nucarty specifies battlefield nuclear artillery. The friendly axis from which the artillery is to be fired must follow.

Weapons for aircraft can be hitech-gnd, lotech-gnd, tacnuc, stratnuc, runways, antiship, pgm, or defsup. Missile weapons are chemical, nuclear or conventional.

For target, a target class, laydown name, or unit name may be given. Nucarty targets enemy ground forces on the FLOT or flanks within the same axis, thus the null string, "", should be given. Target classes, such as MAIR-major, are followed by the site type and the region, axis, or zone. A laydown name must be followed by a region. If the weapon type to be executed is an ALCM, a release region must also be specified.

The CAMPAIGN Strike order is generated. The Gen-tac-nuc-weapon-use or Conventional-warfare flag is set after 3 hours.

Task-order

```
Table Task-order
  pct  force          unit       task      in-region
  ===  ============   =========  ========  =========.
  100  "BCG.70-1"     Destroyer  Area-ASW  IUU-Gap
```

This specifies non-routine missions for naval task groups and alerts or changes the operational area of attack submarine groups. Attack submarine groups have a default task of ASW, and surface groups of Strike. Tasked missions are only relevant to a group's operational area and are automatically cancelled when deployment orders make any current task obsolete. The task order itself causes no automatic deployment (except for attack submarine groups which will shift their operational area if the order indicates a change).

The CAMPAIGN Task order is generated.

Terminate-order

```
Table Terminate-order
  arena
  =====.
  CEUR .
```

This stops all combat in a main theater.

The CAMPAIGN Terminate order is generated. The Terminate flag is set after 6 hours in all regions of the arena. The following flags are terminated in the same regions: Poising, Conventional-warfare, Engagement, Bio-weapon-use, Chem-weapon-use, ASW, Strat-ASW, Demo-tac-nuc-weapon-use, Gen-tac-nuc-weapon-use, Demo-strat-nuc-weapon-use, CF-strat-nuc-weapon-use, and Gen-strat-nuc-weapon-use.

Terminate-action-order

```
Table Terminate-action-order
  actor  action    region
  =====  ========  ======.
  Red    Blockade  GDR    .
```

This is the order to the flag model to immediately terminate the given action of the given actor in the given region.

Unassign-order

```
Table Unassign-order
  unit    owner  command  arena  in-region
  ======  =====  =======  =====  =========.
  Aircav  US     AFCENT   CEUR   all       .
```

This unassigns the selected forces. See the Assign-order for the effects of assignment. If arena is "all," orders are given for all arenas under that command.

The CAMPAIGN Unassign order is generated.

Unassign-by-name-order

```
Table Unassign-by-name-order
  unit-name          owner
  =================  =====.
  "1st-Inf"          US    .
```

This unassigns the named force. See the Assign-order for the effects of assignment.

The CAMPAIGN Unassign order is generated.

VII. COMMUNICATIONS

Notifications: Communications up the Red or Blue Chain of Command

Parameter	Meaning	Legal Values
reason	Reason for notification	Type-reason
recommendation	Recommendation for action	Type-recommendation
command	Red or Blue agent command	Type-command

Notifications are the message mechanism by which commands within Red and Blue Agents report to their superior commands. Thus a notification from an AFCENT analytic war plan would be received by the EUR plan and, if sent further, would be received by the JCS plan, and finally the NCA. This communication is one-way, from lower commands to higher.[1]

```
Perform Notify-higher-authority using
  Type-reason          as reason,
  Type-recommendation as recommendation.
```

The values of the enumerations Type-reason and Type-recommendation are listed in Section XI. A notification can be read using the following functions:

```
Let Type-command be the report from Ask-sender-of-current-notification.
Let Type-command be the report from Ask-origin-of-current-notification.
Let Type-reason  be the report from Ask-reason-of-current-notification.

Let Type-recommendation be the report from
    Ask-recommendation-of-current-notification.
```

A notification has both an origin, which is the command that originated the notification, and a sender, which is the last command to forward the notification. Many notifications originate with an ACL plan (such as AFCENT) and are forwarded unaltered to the NCL. A notification is forwarded unread by this function:

```
Perform Forward-notification.
```

[1]Higher commands communicate to their subordinates by issuing authorizations, other guidance, and force orders.

The function Ask-notification-received returns Yes if a command has received a notification from a lower level. Plans above the area command level use this as a wakeup rule.

```
Let Yes be the report from Ask-notification-received.
```

The function Ask-notification-response returns Yes if a superior command has responded to the notification sent by the querying command. When a notification is sent, the sending plan goes to sleep waiting for a response. This is handled automatically within the function Notify-higher-authority, so that upon sending a notification, a command will not continue until its superior command has responded.

```
Let Yes be the report from Ask-notification-response.
```

Response to a notification may require the forwarding of the notification to a higher command, the setting of guidance variables, or doing nothing. After the receiving command has completed its actions, it indicates its response to the lower command using the function Clear-notification-prompt.

```
Perform Clear-notification-prompt.
```

The last notification sent by each command can be examined in the Data Editor tableau set "User-generated/control.T", tableau "Blue Reports" and "Red Reports."

Cables: Information from Red or Blue to Green Countries

Parameter	Meaning	Legal Values
side	Requests country to ally or become neutral	Type-color
cooperation	Level of aid requested	Type-cooperation
home-involvement	Level of involvement in home theater requested	Type-involvement
other-involvement	Level of involvement in another theater requested	Type-involvement
area	Other theater of interest	Type-area

Cables are the message mechanism by which the GCLs of Red and Blue Agents communicate their requests for changes in political postures, basing privileges, and control of forces. This communication is one-way from Red or Blue Agent to a third

country, and may be delayed depending on the political and military situation in the receiving country.

```
Table  Cable
                                    home-          other-          other-
  country   side   cooperation      involvement    involvement     area
  =======   ====   =============    ===========    =============   ==========.
  Belgium   Blue   Combat-basing    Full-alert     Partial-alert   MEast      .
```

"Side," if Red or Blue, requests that the country ally or remain an ally; if White, requests it be Neutral. "Cooperation" defines to what extent the country is aiding its superpower ally. "Involvement" defines each country's level of involvement in a theater. "Other-area" is a secondary arena where the superpower is requesting involvement of forces.

The last cable received by each country can be examined in the Data Editor tableau set "User-generated/control T".

Hotlines: Negotiation Messages Between Red and Blue

Parameter	Meaning	Legal Values
request	Request for action	Type-hotline-request
reward	Reward for making requested action	Type-hotline-reward
penalty	Penalty for not making requested action	Type-hotline-penalty
deadline	Hours from game-start when the penalty will be carried out	1.0

Hotlines are the message mechanism by which the GCLs of Red and Blue agents may communicate. The message below means "If you Do-not-escalate, then I Will-not-escalate, else I will escalate to Eur-demo-tac-nuc at day 10, 0 hour."

```
Table Hotline
  request           reward              penalty             deadline
  ================  ==================  ==================  ========.
  Do-not-escalate   Will-not-escalate   Eur-demo-tac-nuc    (10 * 24).
```

Note that penalties are levels of escalation that will be carried out if the request is not carried out by the stated deadline.

A Hotline message appears in following variables:

```
Let Hotline-request  of Type-hotline-channel be Type-hotline-request.
Let Hotline-reward   of Type-hotline-channel be Type-hotline-reward.
Let Hotline-penalty  of Type-hotline-channel be Type-hotline-penalty.
Let Hotline-deadline of Type-hotline-channel be 1.
Let Hotline-ringing  of Type-hotline-channel be Yes.
```

Each variable is indexed by the channel appropriate to the direction of the communication (Blue-to-Red or Red-to-Blue).

When Hotline-ringing is Yes, a new Hotline message is present. This will cause the receiving GCL to wake up to read the message. After reading, Hotline-ringing of the appropriate channel must always be set back to No in order to remove the wakeup condition. GCLs will also wake up to inform the NCLs by notification if the request part of a Hotline message has been carried out, or the deadline has been passed. This capability has been implemented only as a simple example.

The last hotlines sent can be examined in the Data Editor tableau set "User-generated/control.T."

Announcements: Negotiation Messages from Green Countries

Parameter	Meaning	Legal Values
country	Country making the announcement	Type-country
channel	Identifies message as to/from Blue/Red	Type-channel
action	Request for action	Type-hotline-request
reward	Reward for making requested action	Type-hotline-reward
penalty	Penalty for not making requested action	Type-hotline-penalty
deadline	Hours from game-start when the penalty will be carried out	1.0

Announcements are the message mechanism by which the GCLs of Red and Blue agents and third countries modeled by Green Agent communicate "If-then-else" messages. The message below means "From FRG To-Blue: If you Provide-nuc-defense, then I will do nothing (--), else I will Cease-fire at day 10, 0 hour."

```
Table  Announce
  country channel action              reward penalty    deadline
  ======= ======= ================== ====== ========== ==========.
  FRG     To-Blue Provide-nuc-defense --     Cease-fire (10 * 24).
```

An announcement appears in following variables;

```
Let Announced-deadline   of Type-country, Type-channel be 1.
Let Announced-action     of Type-country, Type-channel be
    Type-announced-action.
Let Announced-reward     of Type-country, Type-channel be
    Type-announced-reward.
Let Announced-penalty    of Type-country, Type-channel be
    Type-announced-penalty.
Let Announcement-pending of Type-country, Type-channel be Yes.
```

Each variable is indexed by the channel appropriate to the direction of the communication (To-Red, To-Blue, From-Red, or From-Blue). When Announcement-pending is Yes, a new announcement is present. This will cause Green Agent or the receiving GCL to wake up to read the announcement. After reading, Announcement-pending of the appropriate country and channel must always be set back to No in order to remove the wakeup condition. Announcements are also used in only a few simple examples.

The last announcements sent and received by each country can be examined in the Data Editor tableau set "User-generated/control T."

VIII. QUERIES

Force queries are RAND-ABEL functions that report a data value about the state of the world from the force models. Force queries begin, with a few exceptions, with the words "Ask-force." Table 14 lists the available queries and the values reported. Queries that may only be used by one of the major agents are listed as either Blue's or Red's.

In RAND-ABEL code, the value reported by a query is either assigned to a variable:

```
Let flot be the report from Ask-force-overlay-data using
     FLOT-location as data, and CEUR-7 as overlay.
```

or compared to another value in an If statement:

```
If 100 is greater than the report from Ask-force-overlay-data using
     FLOT-location as data, and CEUR-7 as overlay
Then . . . .
```

Queries are available that report data at levels of aggregation corresponding to most of the different RSAS geographies. Different queries will report data on forces on an overlay (an axis such as CEUR-7), in a region (USSR-W), in a country (USSR), assigned to an arena (CEUR), assigned to all arenas of a command (AFCENT), or in a theater (Central-Europe).

In addition to the queries reporting numbers, there are a series of queries that report the level of conflict and status of various military actions. These were developed primarily for use by the NCL models in characterizing the situation in each theater, but are also used by AWPs to determine when conflict has begun or nuclear weapons are first used and a new phase must be entered.

The ultimate conflict level in a theater or region is determined from the level of Red's, Blue's, and other's (third country's) involvement in that region, which in turn is derived from the specific military actions each has taken. Force queries exist for each of these levels.

The possible levels of action, involvement and conflict are shown in Table 15. The query functions that begin with the word "Test-" are used to test the status of actions that are modeled by the CAMPAIGN force model, otherwise the Flag model is queried.

Table 14

FORCE QUERIES PROVIDED WITH THE RSAS

Query Name	Value Reported
Ask-force-overlay-data	Number
Ask-force-region-data	
Ask-force-arena-data	
Ask-force-country-data	
Ask-force-theater-data	
Ask-force-strategic-data	
Blue's Ask-force-command-data	
Red's Ask-force-command-data	
Ask-force-regional-conflict-level	Type-conflict-level
Ask-force-theater-conflict-level	
Ask-force-regional-involvement	Type-military-involvement
Ask-force-country-involvement	
Ask-force-theater-involvement	
Test-mobilization	Yes/No
Test-alert	
Test-deployment	
Test-poising	
Test-limited-combat	
Test-conventional-warfare	
Test-demo-tac-nuc-weapon-use	
Test-gen-tac-nuc-weapon-use	
Test-bomber-launch	
Test-demo-strat-nuc-weapon-use	
Test-CF-strat-nuc-weapon-use	
Test-gen-strat-nuc-weapon-use	
Ask-force-country-status	Type-conflict-level
Ask-force-region-status	
Ask-force-theater-status	
Ask-force-regional-action-status	Yes/No
Ask-force-theater-action-status	
Ask-force-arena-action-status	
Ask-force-count	Number
Ask-force-count-by-region	
Ask-force-count-sorties-by-region	
Ask-force-count-by-country	
Ask-force-count-totals-by-region	
Blue's Ask-force-count-by-command	
Red's Ask-force-count-by-command	

Table 14

FORCE QUERIES PROVIDED WITH THE RSAS (CONT'D)

Query Name	Value Reported
Ask-force-casualties	Number
Ask-force-damage-estimate	
Ask-force-target-damage	
Ask-force-raidcount	
Ask-force-parameter	
Blue's Ask-force-SIOP-plan-option	
Red's Ask-force-RISOP-plan-option	
Ask-force-sea-control	Type-sea-control
Ask-force-pt-axis-control	Type-owner
Blue's Ask-force-US-warning-system	Type-warning-system-status
Blue's Ask-force-warning-system-reporting	Yes/No
Red's Ask-force-USSR-warning-system	Type-warning-system-status
Red's Ask-force-warning-system-reporting	Yes/No

Table 15

TYPES OF CONFLICT STATUS

Action status	Involvement	Conflict level
None	None	Peace
Preparing	Preparation	Crisis
In-progress	Demo-conv	Regional-conflict
Completed	Gen-conv	Superpower-presence
	Demo-tac-nuc	Challenge
	Tac-nuc	Regional-nuclear
	Demo-strat-nuc	Gen-conv
	CF-strat-nuc	Demo-tac-nuc
	Strat-nuc	Gen-tac-nuc
		Demo-strat-nuc
		CF-strat-nuc
		Gen-strat-nuc

Corresponding to the actions of a given side in a region or theater is the military involvement of that side there. Table 16 shows this relationship. A given side's involvement in a region is simply the highest level of involvement associated with any particular action occurring in that region. Similarly, a side's involvement in a theater is the greatest involvement in any one region of that theater.

The combination of involvements for each side in a region or theater results in a particular conflict level as shown in Table 17. Note that involvement of other countries

does not result in as high a conflict level as does the same involvement of either of the principal Red and Blue sides.

At the start of an RSAS run, no actions are In-progress, the involvement of all sides is None, and there is Peace in every region of the world.

QUERY PARAMETERS

Since many queries use the same kinds of parameters to specify the data requested, the common parameters and their values are listed in Table 18. Where the value listed is 1.0, any real number may be used, where it is an enumeration (beginning with the word "Type") the allowed values are found under that name in Section XI.

QUERY FUNCTIONS

Ask-force-arena-action-status

This function reports whether an action by a particular side in the given arena is happening.

```
the report from Ask-force-arena-action-status
  using Red       as actor,
        Blockade  as action, and
        WTVD      as arena
```

Ask-force-arena-data

This function reports data aggregated by arena. Data items not appropriate to the model of the given arena (CAMPAIGN-MT or CAMPAIGN-ALT) report a value of 0.

```
the report from Ask-force-arena-data
  using Land-attrition as data, and
        CEUR           as arena
```

Allowed Data Items of Type-arena-aggregation	
Avg-FLOT-location	Avg-FLOT-rate
Deepest-penetration	Land-attrition
Air-attrition	Tnuc-attrition
Divisions	Total-EDs
Total-FLOT-EDs	Conv-COF
Tacair-sorties	Fighter-sorties
Multi-air-air-sorties	Cas-sorties
Interdictor-sorties	M-bomber-sorties
Multi-air-gnd-sorties	Nuc-weapons

Table 16

RELATIONSHIP BETWEEN AN ACTION AND THE INVOLVEMENT OF SIDE

Action name	Involvement of side
Increased-training	Preparation
Mobilization	Preparation
Alert	Preparation
Deployment	Preparation
Dispersal	Preparation
Poising	Preparation
Generation	Preparation
Blockade	Demo-conv
Challenging-blockade	Demo-conv
Tripwire-set	Demo-conv
Engagement	Gen-conv
Conventional-warfare	Gen-conv
Bio-weapon-use	Gen-conv
Chem-weapon-use	Gen-conv
ECM	Preparation
Satellite-launch	Preparation
Satellite-movement	Preparation
ASAT	Gen-conv
ASW	Gen-conv
Strat-ASW	Gen-conv
Encirclement	Gen-conv
Demo-tac-nuc-weapon-use	Demo-tac-nuc
Gen-tac-nuc-weapon-use	Tac-nuc
Strategic-force-dispersal	Preparation
Leadership-dispersal	Preparation
City-evacuation	Preparation
Transport-sabotage	Preparation
Comm-sabotage	Preparation
Leadership-sabotage	Preparation
C3-launch	Preparation
Bomber-launch	Preparation
Demo-strat-nuc-weapon-use	Demo-strat-nuc
CF-strat-nuc-weapon-use	CF-strat-nuc
Gen-strat-nuc-weapon-use	Strat-nuc
Jamming	Preparation
UCW	Preparation
Special-operation	Demo-conv
Termination	None

Table 17

CONFLICT LEVEL BASED ON MILITARY INVOLVEMENT OF ALL SIDES

Red Involvement	Blue Involvement	Other Involvement	Conflict Level
Strat-nuc	--	--	Gen-strat-nuc
--	Strat-nuc	--	Gen-strat-nuc
--	--	Strat-nuc	Regional-nuclear
CF-strat-nuc	--	--	CF-strat-nuc
--	CF-strat-nuc	--	CF-strat-nuc
--	--	CF-strat-nuc	Regional-nuclear
Demo-strat-nuc	--	--	Demo-strat-nuc
--	Demo-strat-nuc	--	Demo-strat-nuc
--	--	Demo-strat-nuc	Regional-nuclear
Tac-nuc	--	--	Gen-tac-nuc
--	Tac-nuc	--	Gen-tac-nuc
--	--	Tac-nuc	Regional-nuclear
Demo-tac-nuc	--	--	Demo-tac-nuc
--	Demo-tac-nuc	--	Demo-tac-nuc
--	--	Demo-tac-nuc	Regional-nuclear
Gen-conv	Gen-conv	--	Gen-conv
Gen-conv	Preparation	--	Challenge
Preparation	Gen-conv	--	Challenge
Gen-conv	--	--	Superpower-presence
--	Gen-conv	--	Superpower-presence
--	--	Gen-conv	Regional-conflict
Demo-conv	--	--	Superpower-presence
--	Demo-conv	--	Superpower-presence
--	--	Demo-conv	Crisis
Preparation	--	--	Crisis
--	Preparation	--	Crisis
--	--	Preparation	Crisis
None	None	None	Peace

Ask-force-casualties

This function reports civilian casualties from prompt nuclear effects in the given country.

```
the report from Ask-force-casualties using FRG as country
```

Table 18

ALLOWED VALUES FOR QUERY PARAMETER

Parameter	Allowed Values
action	Type-action
actor	Type-actor
arena	Type-arena
assigned-arena	Type-arena
command	Type-command
country	Type-country
minimum-status	Type-weapon-status
order	"string"
overlay	Type-overlay
owner	Type-country
plan-option	Type-plan-option
pt-axis	Type-overlay
region	Type-region
side	Type-color
site	Type-site
status	Type-what-to-count
target	Type-force-target
theater	Type-theater
unit	Type-unit
warheads-detected	Type-warheads-detected
warning-system	Type-US-warning-system
weight	Type-weighting

Ask-force-command-data

This function reports data aggregated by command by summing the data for all of the arenas under the given command. Data items not appropriate to the model of each arena (CAMPAIGN-MT or CAMPAIGN-ALT) report a value of 0.

```
the report from Ask-force-command-data
  using Divisions as data, and
        HCFFE     as command
```

Allowed Data Items of Type-command-aggregation	
Avg-FLOT-location	Avg-FLOT-rate
Deepest-penetration	Land-attrition
Air-attrition	Tnuc-attrition
Divisions	Total-EDs
Total-FLOT-EDs	Conv-COF
Tacair-sorties	Fighter-sorties
Multi-air-air-sorties	Cas-sorties
Interdictor-sorties	M-bomber-sorties
Multi-air-gnd-sorties	Nuc-weapons

Ask-force-count

This function counts and reports numbers of specified forces.

```
the report from Ask-force-count
  using Troops        as unit,
        Red           as side,
        USSR          as owner,
        USSR-Cen-Asia as region,
        STVD          as assigned-arena,
        Mobilized     as minimum-status, and
        normal#       as weight
```

The weight parameter may be either normal#, sorties# (count potential sorties for aircraft only), or attrition#.

Ask-force-count-by-command

This function reports data about forces aggregated to the command level by summing data for forces assigned to each arena under the given command.

```
the report from Ask-force-count-by-command
  using Troops    as unit,
      USSR      as owner,
      Poland    as region,
      HCFW      as assigned-command, and
      Mobilized as minimum-status
```

Ask-force-count-by-country

This function reports data about forces aggregated by country by summing data for forces in all regions belonging to the given country.

```
the report from Ask-force-count-by-country
  using POMCUS   as unit,
      Blue     as side,
      US       as owner,
      FRG      as country, and
      Deployed as minimum-status
```

Ask-force-count-by-region

This function reports data about forces. It is the same as the Ask-force-count query but without all of its parameters.

```
the report from Ask-force-count-by-region
  using SSBN          as unit,
        Red           as side,
        USSR          as owner,
        Mid-Atlantic  as region, and
        Normal        as minimum-status
```

Ask-force-count-sorties-by-region

This function reports the number of sorties that can be generated by the given air forces.

```
the report from Ask-force-count-sorties-by-region
  using Tacair    as unit,
        Blue      as side,
        US        as owner,
        FRG       as region, and
        Executed  as minimum-status
```

Ask-force-count-totals-by-region

This function reports data about forces. It is the same as the Ask-force-count query but without all of its parameters.

```
the report from Ask-force-count-totals-by-region
  using Troops as unit,
        Red    as side,
        USSR   as owner, and
        GDR    as region
```

Ask-force-country-data

This function reports data aggregated by country.

```
the report from Ask-force-country-data
  using Red         as side,
        Poised-EDs  as data, and
        GDR         as country
```

Ask-force-country-involvement

This function reports the involvement of the given side in this country.

```
the report from Ask-force-country-involvement using
  FRG           as country, and
  Blue          as side.
```

Allowed Data Items of Type-country-aggregation	
Deployed-EDs	Poised-EDs
Conv-COF	
Combat-afld-damage	Other-afld-damage
Missile-silo-damage	Naval-base-damage
Seaport-damage	Com-control-damage
Commo-damage	Nuc-power-gen-damage
Ground-base-damage	Nuc-prod-damage
Nuc-storage-damage	Ammo-prod-damage
Ammo-storage-damage	Arms-prod-damage
Arms-storage-damage	POL-prod-damage
POL-storage-damage	Other-prod-damage
Carriers	Other-surface
Attack-subs	SSBNs
Carrier-damage	Other-surface-damage
Attack-sub-damage	SSBN-damage
Transiting-Carriers	Transiting-Other-surface
Transiting-Attack-subs	Transiting-SSBNs

Ask-force-country-status

This function reports the conflict status in the given country, as established by the CAMPAIGN model only, not incorporating flagged actions.

```
the report from Ask-force-country-status
  using France as country
```

Ask-force-damage-estimate

This function reports an estimate of damage to the given target from a launch under attack.

```
the report from Ask-force-damage-estimate
  using USSR      as attacking-country,
        US-SE     as region,
        PLDR-natl as target, and
        main      as site
```

Ask-force-overlay-data

This function reports data aggregated by CAMPAIGN overlay (axis or reserve in a main theater, point or LOC axis in an alternate theater).

```
the report from Ask-force-overlay-data
  using FLOT-location as data, and
        CEUR-7        as overlay
```

Allowed Data Items of Type-overlay-aggregation	
FLOT-location	FLOT-rate
Divisions	Avg-pct
Total-EDs	Combat-EEDs
FLOT-EEDs	Land-attrition
Air-attrition	Tnuc-attrition
Conv-COF	Ground-goal

Ask-force-parameter

This function reports the value of a CAMPAIGN parameter. The order string should be the same that would be typed to the Force window to set the parameter, but without the initial "set" or the final number.

```
the report from Ask-force-parameter
  using "landwar CEUR min-density" as order
```

Ask-force-pt-axis-control

This function reports the controlling side of an alternate theater point axis.

```
the report from Ask-pt-axis-control
  using B-Athens-24 as pt-axis
```

Ask-force-raidcount

This function reports the number of incoming enemy missiles detected by the warning systems of the given country.

```
the report from Ask-force-raidcount
  using US            as country, and
        ICBM-warheads as warheads-detected
```

Ask-force-region-data

This function reports data aggregated by region.

```
the report from Ask-force-region-data
  using Blue          as side,
        Mobilized-EDs as data, and
        Italy         as region
```

Allowed Data Items of Type-region-aggregation	
Total-EDs	Mobilized-EDs
Deployed-EDs	Poised-EDs
Conv-COF	
Combat-afld-damage	Other-afld-damage
Missile-silo-damage	Naval-base-damage
Seaport-damage	Com-control-damage
Commo-damage	Nuc-power-gen-damage
Ground-base-damage	Nuc-prod-damage
Nuc-storage-damage	Ammo-prod-damage
Ammo-storage-damage	Arms-prod-damage
Arms-storage-damage	POL-prod-damage
POL-storage-damage	Other-prod-damage
Carriers	Other-surface
Attack-subs	SSBNs
Carrier-damage	Other-surface-damage
Attack-sub-damage	SSBN-damage
Transiting-Carriers	Transiting-Other-surface
Transiting-Attack-subs	Transiting-SSBNs

Ask-force-region-status

This function reports the conflict status in the given region, as established by the CAMPAIGN simulation only, not incorporating flagged actions.

```
the report from Ask-force-region-status
  using USSR-W as region
```

Ask-force-regional-action-status

This function reports whether a side has initiated an action in the region.

```
the report from Ask-force-regional-action-status
  using Red     as actor,
        Poising as action, and
        GDR     as region
```

Ask-force-regional-conflict-level

This function reports the conflict level in the given region.

```
the report from Ask-force-regional-conflict-level
  using FRG as region
```

Ask-force-regional-involvement

This function reports the level of involvement of a particular side in the given region, as determined from the actions taken in the region.

```
the report from Ask-force-regional-involvement
  using South-Korea as region, and
        Blue        as side
```

Ask-force-RISOP-plan-option

This function reports the number of warheads for the requested RISOP plan option and status.

```
the report from Ask-force-RISOP-plan-option
  using LUA-1     as plan-option, and
        Available as status
```

Ask-force-sea-control

This function reports the controlling side of a sea region.

```
the report from Ask-force-sea-control
  using Mid-Atlantic  as region
```

Ask-force-SIOP-plan-option

This function reports the number of warheads for the requested SIOP plan option and status.

```
the report from Ask-force-SIOP-plan-option
  using LUA-1     as plan-option, and
    Available as status
```

Ask-force-strategic-data

This function reports data on strategic forces.

```
the report from Ask-force-strategic-data
  using Blue           as side, and
        Launched-ICBMs as data
```

Allowed Data Items of Type-strategic-aggregation	
1st-strike-capability	Launched-ICBM-warheads
2nd-strike-capability	Launched-ICBMs
Air-defense-attrition	Launched-SLBM-warheads
Alerted-H-bombers	Launched-SLBMs
Alerted-ICBMs	Launched-bomber-warheads
Alerted-SLBMs	Lost-H-bombers
Ammo-prod-damage	Lost-ICBMs
Ammo-storage-damage	Lost-SLBMs
Arms-prod-damage	Missile-silo-damage
Arms-storage-damage	Naval-base-damage
Available-warheads	Nuc-power-gen-damage
Com-control-damage	Nuc-prod-damage
Combat-afld-damage	Nuc-storage-damage
Commo-damage	Operational-H-bombers
Damaged-warheads	Operational-ICBMs
EMT	Operational-SLBMs
Exchange-ratio	Other-afld-damage
Executed-H-bombers	Other-prod-damage
Executed-ICBMs	POL-prod-damage
Executed-SLBMs	POL-storage-damage
Ground-base-damage	Seaport-damage
LUA-capability	Total-warheads
Launched-H-bombers	Used-warheads

Ask-force-target-damage

This function reports the damage to the given target.

```
the report from Ask-force-target-damage
      PLDR-natl as target,
      USSR      as country, and
      US-SE     as region
```

Ask-force-theater-action-status

This function reports whether a side has initiated an action in the theater.

```
from Ask-force-theater-action-status
  using Blue           as actor,
    Tripwire-set   as action, and
    Southwest-Asia as theater
```

Ask-force-theater-conflict-level

This function reports the conflict level in the theater, which is the greatest level in any of its constituent regions.

```
the report from Ask-force-theater-conflict-level
  using Atlantic as theater
```

Ask-force-theater-data

This function reports data aggregated by theater by summing data for all of the arenas under the given theater. Data items not appropriate to the model of each arena (CAMPAIGN-MT or CAMPAIGN-ALT) report a value of 0.

```
the report from Ask-force-theater-data
  using Red            as side,
        Tnuc-attrition as data, and
        Central-Europe as theater
```

Allowed Data Items of Type-theater-aggregation	
Air-attrition	Military-damage
Available-warheads	Mobilized-EDs
Avg-FLOT-location	Nuc-COF
Avg-FLOT-rate	Nuc-weapons
Conv-COF	Other-damage
Damaged-warheads	Poised-EDs
Deepest-penetration	Strategic-damage
Deployed-EDs	Tnuc-attrition
Divisions	Total-EDs
EMT	Total-warheads
Land-attrition	Used-warheads
Attack-sub-damage	Other-surface
Attack-subs	Other-surface-damage
Carrier-damage	SSBN-damage
Carriers	SSBNs

Ask-force-theater-involvement

This function reports the involvement of the given side in the theater, which is the greatest of the involvements in its constituent regions.

```
the report from Ask-force-theater-involvement
  using Middle-East as theater, and
        Blue        as side
```

Ask-force-theater-status

This function reports the conflict status of the given theater, which is the greatest of those of its constituent regions. This conflict status is established by the CAMPAIGN simulation only, not incorporating flagged actions.

```
the report from Ask-force-theater-status
  using Central-Europe as theater
```

Ask-force-US-warning-system

This function reports the status of the given US warning system (Up, Down or Unknown).

```
the report from Ask-force-US-warning-system
  using DSP-E as warning-system
```

Ask-force-USSR-warning-system

This function reports the status of the given USSR warning system (Up, Down, or Unknown).

```
the report from Ask-force-USSR-warning-system
  using SOV-BWARN as warning-system
```

Ask-force-warning-system-reporting

This function reports whether the warning system of the given country is reporting incoming missiles.

```
the report from Ask-force-warning-system-reporting
  using US    as country, and
        DSP-E as warning-system
```

Test-alert

This function reports Yes if a side's troops are on alert in the region (at whatever level of alert).

```
the report from Test-alert
  using Red         as actor, and
        USSR-Moscow as region
```

Test-bomber-launch

This function reports Yes if the action Bomber-launch is in progress.

```
the report from Test-bomber-launch
  using Blue       as actor, and
        US-NPlains as region
```

Test-CF-strat-nuc-weapon-use

This function reports Yes if the action CF-strat-nuc-weapon-use is in progress. The threshold is variable.

```
the report from Test-CF-strat-nuc-weapon-use
  using Red   as actor, and
        US-NE as region
```

Test-conventional-warfare

This function reports Yes if combat is occurring in the region.

```
the report from Test-conventional-warfare
  using Red     as actor, and
        Iran-NW as region
```

Test-demo-strat-nuc-weapon-use

This function reports Yes if the action Demo-strat-nuc-weapon-use is in progress. The threshold is variable.

```
the report from Test-demo-strat-nuc-weapon-use
  using Blue   as actor, and
        USSR-W as region
```

Test-demo-tac-nuc-weapon-use

This function reports Yes if the action Demo-tac-nuc-weapon-use is in progress. The threshold is variable.

```
the report from Test-demo-tac-nuc-weapon-use
  using Blue   as actor, and
        Poland as region
```

Test-deployment

This function reports Yes if troops are being deployed by the given side in the region.

```
the report from Test-deployment
  using Blue    as actor, and
        Iran-SW as region
```

Test-gen-strat-nuc-weapon-use

This function reports Yes if the action Gen-strat-nuc-weapon-use is in progress. The threshold is only a very rough guess.

```
the report from Test-gen-strat-nuc-weapon-use
  using Blue        as actor, and
        USSR-Moscow as region
```

Test-gen-tac-nuc-weapon-use

This function reports Yes if the action Gen-tac-nuc-weapon-use is in progress. The threshold is only a very rough guess.

```
the report from Test-gen-tac-nuc-weapon-use
  using Red as actor, and
        FRG as region
```

Test-limited-combat

This situation characterization function returns Yes if limited combat is occurring in the region given by a "Limited" status in the Campaign model.

```
the report from Test-limited-combat
  using Red  as actor, and
  Iran-NW     as region
```

Test-mobilization

This function reports Yes if the side is mobilizing troops in the region.

```
the report from Test-mobilization
  using Red    as actor, and
        USSR-W as region
```

Test-poising

This function reports Yes if the side's troops have poised in the region.

```
the report from Test-poising
  using Red            as actor, and
        Czechoslovakia as region
```

IX. FLAGS

Flag Model Overview

The Flag Model is a RAND-ABEL force model available to the Red and Blue agents. Using a simple set of arrays, it keeps track of the status of a set of actions by region and actor. When one of the list of actions is ordered, a flag is raised (or single value set) to indicate that the action is taking place. No detailed modeling takes place. To add a new action, simply add the action name to the enumerated list of actions, found in Section XI, Type-action. Current values of Type-action range from Alert to CF-strat-nuc-weapon-use. The RSAS decision agents often use this mechanism to indicate actions for which no detailed force model exists, or is even possible. Some of these actions cover capabilities of other force models. Actions such as Conventional-combat are only modeled by CAMPAIGN in certain regions of the world. The Flag Model allows these actions to be captured worldwide. The model keeps the following statuses for each action.

Status	Meaning
None	The action has never been ordered.
Preparing	The action has been ordered but has not yet started.
In-progress	The action is currently proceeding.
Completed	The action has completed.

Actions are also differentiated by the actor ordering them, either Red, Blue, or White (neither Red or Blue). Thus a Blockade ordered by Red in West-Berlin is distinct from one ordered by Blue

The Flag Model can be found in the file Src/Force-A/Abel-force/flag.A, and its data dictionary declarations in the file Dict/flag.D beneath that.

Flag Model Interface

The interface to the Flag Model consists of the orders Initiate-action-order and Terminate-action-order, and the query Ask-force-flag-status.

```
Table  Initiate-action-order
  actor  action     region  delay          duration
  =====  ========   ======  =============  ========.
  Red    Blockade   GDR     6.0 [hours]    never    .
```

```
Table Terminate-action-order
  actor  action     region
  =====  ========   ======.
  Red    Blockade   GDR    .

If the report from Ask-force-flag-status using
  Red as actor, Blockade as action, and GDR as region is In-progress
Then . . . .
```

These functions are part of the Force interface and may be used by Red and Blue agent writers. Some existing force orders and queries also refer to the Flag Model either entirely, or where other force models do not meet their complete capability.

X. LIBRARY OF BLUE AND RED PROCEDURES

This section lists the names of library functions representing standard operating procedures that might be called upon by any number of AWPs. The procedures are grouped by side and command; to the right of the names are brief descriptions of functions performed.

LIBRARY OF BLUE PROCEDURES

Procedures in AWP/Blue/Jcs/library.A

Implement-DEFCON	Checks by Command if DEFCON-ordered is changed; if so, performs <Command>-implement-DEFCON.
JCS-implement-DEFCON	Orders actions appropriate to DEFCON level. Worldwide alert. Not specifically implemented. Determines if US forces should be withdrawn from NATO control or commitment. Not implemented. Performs Joint-Emergency-Evacuation-Plan. Not implemented. Performs Implement-CRAF-III. Mobilizes airlift. Performs Requisition-merships. Mobilizes sealift.
NORAD-implement-DEFCON	Orders actions appropriate to DEFCON level. Performs Alert-NORAD. Alerts and disperses U.S. and Canadian fighters.
REDCOM-implement-DEFCON	Orders actions appropriate to DEFCON level. No specific actions implemented.
SOUTH-implement-DEFCON	Orders actions appropriate to DEFCON level. Performs SOUTH-maximum-alert. Alerts air.
JCS-mobilization	Orders U.S. national mobilization. Performs 100K-Eur-mobilization-order. Mobilizes lift and C3 for Europe. Performs Full-mobilization-order. Mobilizes all U.S. forces. Performs Demobilization-order. Not implemented; orders mobilization, not demobilization.

Procedures in AWP/Blue/Eur/library.A

EUR-implement-DEFCON	Performs EUR-alert-UCW-forces. Rules commented out; pending Force implementation of special forces. Performs EUR-alert-TNF. Rules commented out; pending Force implementation of alert for these forces. Performs EUR-disperse-TNF. Disperses TNF. Performs EUR-disperse-tacnucs. Disperses tacnucs. Performs EUR-disperse-tacair. Disperses tacair. Performs EUR-maximum-alert. Alerts air. Performs EUR-poise-forces. Poises forces in Norway and FRG. Performs EUR-evacuation. Not implemented.
Implement-NATO-alert	Performs NATO-simple-alert-order. Alerts ECM and tacair; requests NATO allies on-call. Performs NATO-reinforced-alert-order. Alerts air; mobilizes troops. Mining not implemented. Disperses air. Performs NATO-general-alert-order. No specific actions implemented.
NATO-withhold-alert-order	Alerts air in AFCENT.

Procedures in AWP/Blue/Afcent/library.A

In the following function names, angle brackets surrounding a class descriptor, such as <ally>, indicate that the actual function name contains the name of a member of the class, such as Belgium.

US-deploy-to-AFCENT	Deploys ground and air forces in AFCENT. Performs AFCENT-deploy-REFORGER and AFCENT-deploy-POMCUS.
<Ally>-deploy-to-AFCENT	Deploys ground and air forces. One function for each NATO ally, including France.
AFCENT-cover-missing-<ally>	Deploys forces to c · er for missing ally. One function for each of several NATO allies.
AFCENT-test-ally-return	Adjusts return of missing ally.
AFCEN" deploy-returning-<ally>	Deploys forces of returning ally. One function for each of several NATO allies.
AFCENT-move-relieved-forces	Redeploys forces previously covering for missing ally.
AFCENT-support-Austria-move AFCENT-realign-FRG-II-Corps	Orders defense into Austria, builds defenses, and deploys forces.

IGB-barrier-order	Builds barrier at IGB.
<River>-barrier-order	Prepares defenses at specified river.
UK-CAS-deployment-move	Deploys CAS from UK to Netherlands and Belgium.
AFCENT-preemptive-air-move	Orders preemptive air.
AFCENT-init-forward-air-defense-order	Orders initial forward air defense.
AFCENT-widen-air-defense-order	Attacks Poland and Czechoslovakia unless prohibited.
AFCENT-nuclear-dispersal-order	Alerts and disperses forces.
AFCENT-demonstrative-nuclear-use-move	Attacks airfields in western USSR if authorized. AFAPS against FLOT in UK Corps sector.
AFCENT-wake-at-combat	Reports yes if Pact attacks.
NORTHAG-counterattack-order	Orders counterattack in NORTHAG. Lacks encircle order.
CENTAG-attack-into-CZ-order	Orders attack into Czechoslovakia.
AFCENT-deploy-Crested-Cap	Deploys Crested Cap .
AFCENT-deploy-REFORGER	Deploys REFORGER.
AFCENT-deploy-POMCUS	Deploys POMCUS.
AFCENT-deploy-<named force>	Deploys named force.
AFCENT-forward-defense-priority-order	Establishes axes for main priority.
AFCENT-commit-<named force>	Deploys to axis specified when called.
AFCENT-Ems-Rhine-prep	Constructs defenses along Ems-Rhine lines.
AFCENT-initial-air-orders	Employs air forces primarily in defensive counter air role.
AFCENT-rerole-multis-to-attack	Shifts ground attack aircraft to ground attack roles, leaving air defense air in that role.
AFCENT-early-reinforce-order	Commits NATO forces.
AFCENT-delayed-reinforce-order	Reinforces if ally is missing.

AFCENT-initial-defense-move	Determines when and where to commit forces.
AFCENT-adjust-priority	Performs AFCENT-Commit-<named forces>. Reprioritizes axes. Performs Deterrence-axis-values.
AFCENT-battlefield-nuclear-use-move	Orders battlefield nuclear use.
AFCENT-theater-nuclear-use-move	Interdicts Pact reserve ground forces.
AFCENT-massive-military-nuclear-use-move	Orders massive theater nuclear strikes against military targets.
Determine-axis-values	Determines zone on axes containing FLOT; returns characteristics of those and adjacent zones.
AFCENT-determine-axis-status	Determines FLOT and axis values.
AFCENT-fallback-decision	Determines if and where to fall back.
NORTHAG-fallback-order	Orders fallback.
CENTAG-fallback-order	Orders fallback.
AFCENT-fallback-defense-move	Withdraws squadrons from threatened airbases. Determines when and where to commit forces for fallback defense plans.

Procedures in AWP/Blue/Afnorth/library.A

US-deploy-to-AFNORTH	Deploys forces. Disperses air in Norway.
<Ally>-deploy-to-AFNORTH	Deploys named ally's forces.
AFNORTH-wake-at-combat	Reports Yes when combat occurs.
AFNORTH-air-adjustment-move	Allocates CAS and BAI.

Procedures in AWP/Blue/Afsouth/library.A

US-deploy-to-AFSOUTH	Deploys U.S. forces to AFSOUTH.
<Ally>-deploy-to-AFSOUTH	Deploys named ally's forces.

Procedures in AWP/Blue/Cent/library.A

<Country>-deploy-to-CENT	Deploys forces of named country in region.
CENT-wake-at-combat	Reports Yes if combat occurs.

Procedures in AWP/Blue/Korea/library.A

US-deploy-to-KOREA	Deploys U.S. ground forces to Korea.
S-Korea-deploy-to-KOREA	Deploys Korean army to battle positions.
KOREA-forward-defense-order	Activates OCL and disperses air.
KOREA-init-forward-air-defense-order	Orders initial forward air operations.
KOREA-widen-air-defense-order	Widens air war in Korea.
KOREA-ground-support-air-order	Orders ground support.
KOREA-forward-defense-priority-order	Main effort on axes 1 and 2.
KOREA-nuclear-dispersal	Disperses fixed percentage of forces.
KOREA-poise-order	Issues poise order.
KOREA-wake-at-combat	Reports Yes if combat occurs.
KOREA-maximum-alert	Alerts air.
KOREA-deploy-to-KOREA-alt	Alternative KOREAN deployment.

Procedures in AWP/Blue/Pac/library.A

US-deploy-to-PAC	Deploys naval forces to Pacific.
PRC-deploy-ground-to-PAC	Normal PRC deployment to defend.
PAC-wake-at-combat	Reports Yes if combat occurs.
PAC-maximum-alert	Alerts air and SSBNs.

Procedures in AWP/Blue/Lant/library.A

US-deploy-to-LANT	Deploys U.S. forces to Atlantic.
<Ally>-deploy-to-LANT	Deploys forces of named ally.
LANT-wake-at-combat	Reports Yes if combat occurs.
LANT-maximum alert	Alerts air and SSBNs.

Procedures in AWP/Blue/Sac/library.A

SAC-first-stage-alert	Alerts forces.
SAC-disperse-forces	Disperses forces.
SAC-mobilize-reserves	Mobilizes tankers.
SAC-second-stage-alert	Alerts forces slightly higher than first stage.
SAC-bomber-rebase-move	Rebases and disperses some bombers and tankers inland.
SAC-launch-move	Flushes C3 and B-52s.
SAC-wake-to-launch	Reports Yes if launch is authorized or on tactical warning.
SAC-tactical-warning-wake	Reports Yes on tactical warning.
SAC-targeting-strategy-change-wake	Reports Yes if targeting strategy changes.

LIBRARY OF RED PROCEDURES

Procedures in AWP/Red/Dprk/library.A

N-Korea-deploy-to-DPRK	Deploys North Korean forces to DPRK battle positions.
DPRK-ground-attack-order	Orders ground attack in DPRK.
DPRK-air-attack-order	Allocates and apportions aircraft against Blue air and airfields. Orders air dispersal .
DPRK-naval-attack-order	Orders ROE of attack.
DPRK · reallocation-move	Allocates and apportions aircraft.
DPRK-nuclear-dispersal-order	Alerts and disperses forces.

Procedures in AWP/Red/Hcffe/library.A

USSR-deploy-to-HCFFE	Deploys naval and air forces in support of HCFFE.
USSR-deploy-ground-to-HCFFE	Normal deployment against NW PRC.
HCFFE-naval-attack-order	Orders ROE of attack; MPA cover.

Procedures in AWP/Red/Hcfs/library.A

USSR-deploy-to-HCFS	Deploys forces by name and to ordered position.
HCFS-ground-attack-order	Sets medium aggressiveness and attacks in Western Turkey and Iran.
HCFS-air-attack-order	Apportions and allocates aircraft against Iranian air and airfields. Use of chemicals if authorized.

Procedures in AWP/Red/Hcfsw/library.A

HCFSW-deterrence-move	Allocate air to air defense.
USSR-deploy-to-HCFSW	Deploys naval and air forces to battle positions in the Mediterranean and Black Seas.
<NSWP>-deploy-to-HCFSW	Deploys named country's forces to battle positions.
Bulgaria-deploy-against-Greece	Deploys entirely to Greek border.
HCFSW-ground-attack-order	Attacks in Italy and Greece; attacks in Yugoslavia if not withheld.
HCFSW-air-attack-order	Activates Air-command-model against airfields in Italy and Greece.
HCFSW-naval-attack-order	Orders conventional attack of naval forces in E Med; mines all chokepoints.
HCFSW-USSR-ground-deploy-to-Thrace	Attempts deployment of more forces.

Procedures in AWP/Red/Hcfw/library.A

USSR-deploy-to-HCFW	Deploys USSR forces to HCFW battle positions.
USSR-deploy-to-HCFW-no-Austria	Deploys USSR forces to HCFW battle positions. No deployment against Austria.
<NSWP>-deploy-to-HCFW	Deploys named country's forces to HCFW battle positions.
HCFW-determine-missing-ally	Determines which allies are missing.

HCFW-cover-missing-<ally>	Deploys forces.
HCFW-ally-returning	Checks by ally if involvement is at least On-call; if so, performs HCFW-return-<ally>.
HCFW-return-<ally>	Deploys forces of returning ally.
Redeploy-Warsaw-MD-order	Deploy Warsaw MD to HCFW battle positions.
HCFW-revert-to-tactical-defensive	Holds current FLOT position. Performs HCFW-air-defense-move.
HCFW-ground-attack-order	Orders ground attack on axes WTVD 1-9. Attacks into Austria if targeting is authorized.
HCFW-GCM-on	Activates the Ground-commander model.
HCFW-air-attack-order	Allocates and apportions aircraft against Blue air and airfields. Orders air dispersal in GDR, Poland and Czechoslovakia.
HCFW-naval-attack-order	Orders Baltic Fleet to attack.
HCFW-air-reallocation-move	Alerts Fighter-bombers in USSR-W. Deploys Fighter-bombers in USSR-W to GDR. HCFW commits airpower to strikes against NATO forward troops.
HCFW-nuclear-dispersal-order	Alerts and disperses forces.
HCFW-air-defense-move	Allocates and apportions air for tactical defensive phase. Performs Define-laydown-order. Performs Air-plan-order.
HCFW-commit-<force>-to-<axis>	Commits named force.
HCFW-set-D-Day	Sets D-Day to be Today + 2. Performs Notify-higher-authority.
HCFW-have-we-reached-France	Determines if forces have reached France.
HCFW-assess-NATO-defense-posture	Assesses if NATO is still following its peacetime command structure of deployment.
HCFW-battlefield-nuclear-use-move	Conducts battlefield nuclear strikes against NATO.
HCFW-depth-of-front-nuclear-use-move	Conducts limited nuclear strikes against NATO.

Procedures in AWP/Red/Nwcom/library.A

NWCOM-deterrence-move	Apportions air to air defense.
NWCOM-ground-attack-order	Sets aggressiveness as High and attacks in Finland.
NWCOM-air-attack-order	Activates Air-commander model against airfields in Norway.
NWCOM-naval-attack-order	Orders conventional attack of Blue US-Europe SLOCs.

Procedures in AWP/Red/Shc/library.A

<Command>-<level>-alert-order	Orders specified alert level in specified command and cables allies.
HCFW-Austria-cancel	Cancels deployment to attack Austria.
HCFW-Austria initiate	Initiates deployment to attack Austria.
<command>-mobilization-order	Orders full mobilization of command.
SHC-global-unassignment	Unassigns all Soviet forces.
Assign-<command>-core-forces	Assigns forces used by all plans.
Assign-swingforces	Assigns forces swung between commands.
Assign-lift	Assigns airlift and sealift.

Procedures in AWP/Red/Snf/library.A

SNF-launch-move	Orders launch of C3 and bombers but does not commit them to execution.
SNF-generation-move	Generates bombers, tankers, SSBNs, and C3.
SNF-bomber-rebase-move	Rebases half of the bomber and tanker force to Arctic staging bases.
SNF-wake-to-launch	Reports Yes on tactical warning or combat authorization.
SNF-targeting-strategy-change-wake	Reports Yes if targeting strategy has changed.

XI. ENUMERATIONS

Enumerations are ordered sets of values, whose names, by RAND convention, include the prefix "Type." Rule writers need to know the declared values of enumerations to test on them in If-Then statements. The following is a list of useful enumerations presented in alphabetical order.

Type-action

The list of possible flag actions that can be taken by a side (Red, Blue or White) in a region. In cases of ambiguity, such as for Deployment, the region is the destination, rather than the origin. Countries that have not sided with Red or Blue are considered White. See also the Initiate-action order.[1]

```
ASW
Airborne-alert
Alert
Bio-weapon-use
Blockade
Bomber-launch
Bombing-resupply
C3-launch
CF-strat-nuc-weapon-use
Challenging-blockade
Chem-weapon-use
City-evacuation
Civil-war
Comm-sabotage
Conventional-warfare
Demo-strat-nuc-weapon-use
Demo-tac-nuc-weapon-use
Deployment
Diplomats-withdrawn
Dispersal
ECM
Encirclement
Engagement
Gen-strat-nuc-weapon-use
Gen-tac-nuc-weapon-use
Generation
Ground-forces-dispersal
H-bomber-maximum-alert
Increased-QRA
Increased-training
Intl-assist-request
IRBM-dispersal
Launch-for-survival
Leadership-dispersal
Leadership-sabotage
Limited-combat
Major-presence
Mining-harbors
Mobilization
National-emergency
Navy-out-to-sea
Nuc-weapon-dispersal
Occupying-capital
Poising
Return-of-SAC-tankers
Satellite-launch
Satellite-movement
Selective-mob
Setting-up-bastions
Special-operation
SSBN-dispersal
Strategic-ASAT
Strategic-force-dispersal
Tactical-ASAT
Termination
Terrorism
Token-presence
Trailing-SSBNs
Transport-sabotage
Tripwire-set
UCW
Unusual-alert
Unusual-exercise
Unusual-satell-activity
```

[1]This and other orders are listed alphabetically in the Table of Contents.

```
Jamming                          Unusual-training
```

Type-action-status

The possible states for a given action. See also the Ask-force-flag-status query.

```
None
Preparing
In-effect
Terminated
```

Type-air-air-posture

Guidance to the Referee Air Commander Model. See also the Air-commander-guidance order.

```
Offensive
Mixed
Defensive
```

Type-air-arena

The alternate theater air arenas, or theaters of air combat.

```
CEUR-air                         WTVD-air
FEAST-air                        FETVD-air
N-Cape-air                       Mid-Scan-air
S-Scan-air                       Finn-air
Kola-air                         Lenin-air
Denmark-air                      E-German-air
Austria-air                      Yugo-air
Cz-Hun-air                       N-Italy-air
S-Italy-air                      Greece-air
Rom-Bulg-air                     Odessa-air
W-Turk-air                       Mid-Turk-air
E-Turk-air                       Caucasus-air
Iran-air                         Iraq-air
Arabia-air                       Turkistan-air
AG-Pakistan-air                  Fr-Pakistan-air
TF-Iceland-air                   Op-Iceland-air
TF-Cuba-air                      Op-Cuba-air
AG-PRC-NE-air                    Fr-PRC-NE-air
TF-Taiwan-air                    Op-Taiwan-air
TF-Kuril-air                     Op-Kuril-air
TF-Aleutian-air                  Op-Aleutian-air
```

Type-air-arena-force

Forces other than tactical aircraft counted for alternate theater air-arenas.

```
SAM
AWAC
Tanker
```

Type-air-army

The names of air armies. Only Red air forces may be assigned to air armies.

```
Legnica-AA                    Smolensk-AA
Irkutsk-AA                    Moscow-AA
Vinnetsa-AA
```

Type-airforce

Aircraft classes in alternate theaters. See also the Air-apportionment-order.

```
Air-air                       SR-air-gnd
MR-air-gnd                    LR-air-gnd
Multi
```

Type-air-gnd-posture

Guidance to the Referee Air Commander model. See also the Air-commander-guidance order.

```
Deep
Mid-range
Shallow
```

Type-air-plan

Theater bombing plans. See also the Air-plan order.

```
AI
OCA
Non-thtr
Other
AirArmy
```

Type-air-strategy

Air strategy for a command.

```
Air-superiority
Air-to-ground
```

Type-alliance-criteria

Determines whether the alliance is cohesive or not and indicates to the plans whether that should be considered in plan selection. Unspecified means alliance cohesion is not to be considered.

```
Problems
Cohesive
```

Type-allocatable-resource

Theater resources that may be allocated to axes. See also the Allocate-CAS-BAI-order.

```
BAI
CAS
```

Type-announced-action

The action promised as part of a message to or from a Green Agent third country. See also the communication Announce.

```
Allow-transit                    Cease-fire
Cease-preparations               Not-attack-homeland
Not-nuc-homeland                 Provide-conv-defense
Provide-military-assistance      Provide-nuc-defense
Surrender                        Withdraw-from-my-territory
Withdraw-to-your-territory
```

Type-announced-penalty

The penalty promised as part of a message to or from a Green Agent third country. See also the communication Announce.

```
Attack-your-forces               Attack-your-territory
Cease-cooperation                Cease-defending-you
Commit-forces                    Escalate
Nuc-your-territory               Prepare-forces
Surrender
```

Type-announced-reward

The reward promised as part of a message to or from a Green Agent third country. See also the communication Announce.

```
Allow-basing                     Allow-nuc-use
Allow-transit                    Cease-fire
Cease-preparations               Commit-forces
Disengage                        Not-attack-your-forces
Not-attack-your-homeland         Not-escalate
Provide-military-assistance      Provide-nuc-defense
Surrender                        Withdraw-from-your-territory
Withdraw-to-my-territory
```

Type-apportionable-group

Groupings of aircraft that can be apportioned separately. See also the main theater air apportionment orders.

```
US                                  Non-thtr
USSR                                AirArmy
Other                               Both
All
```

Type-area

Broad geographic theaters used by Green Agent.

```
NEurope                             CEurope
SEurope                             NAmerica
CAmerica                            SAmerica
Africa                              MEast
SWAsia                              FEast
All
```

Type-arena

An arena is essentially a command and control concept, representing a military theater to which forces can be assigned and in which conflict can occur (the word theater is used interchangeably with arena). Each arena is an overlay of military geography (zones and axes for CAMPAIGN-MT arenas or main theaters, and LOC and point axes for CAMPAIGN-ALT arenas or alternate theaters) defined only for places in the world where the RSAS must adjudicate ground combat. Each arena has a Red and Blue name, representing each command and the overlay elements each side controls. Arenas CEUR through FETVD are CAMPAIGN-MT arenas, and NEUR through Op-Aleutian are CAMPAIGN-ALT arenas.

CEUR-A through FETVD-D are sub-theaters, representing commands covering only some of the axes in a theater (CEUR-A, for instance, represents NORTHAG). Intercon through Med do not represent arenas of ground combat, but exist so that forces may be assigned to them.

```
CEUR                                WTVD
FEAST                               FETVD

NEUR                                NWTVD
TF-Baltic                           Op-Baltic
AG-Balkan                           Fr-Balkan
AG-Turkey                           Fr-Turkey
AG-Iran                             Fr-Iran
```

```
AG-Arabia                    Fr-Arabia
AG-Pakistan                  Fr-Pakistan
TF-Iceland                   Op-Iceland
TF-Cuba                      Op-Cuba
AG-Italy                     Fr-Italy
AG-PRC-NE                    Fr-PRC-NE
TF-Taiwan                    Op-Taiwan
TF-Kuril                     Op-Kuril
TF-Aleutian                  Op-Aleutian

CEUR-A                       WTVD-A
CEUR-B                       WTVD-B
CEUR-C                       WTVD-C

FEAST-A                      FETVD-A
FEAST-B                      FETVD-B
FEAST-C                      FETVD-C
                             FETVD-D

Intercon
Space
Pac
Lant
Med
All
```

Type-arena-aggregation

The measures of forces that are aggregated by arena (such as CEUR) and command (such as AFCENT). See also the Ask-force-arena-data query.

```
Avg-FLOT-location            Avg-FLOT-rate
Deepest-penetration          Land-attrition
Air-attrition                Tnuc-attrition
Divisions                    Total-EDs
Total-FLOT-EEDs              Conv-COF
Tacair-sorties               Fighter-sorties
Multi-air-air-sorties        Cas-sorties
Interdictor-sorties          M-bomber-sorties
Multi-air-gnd-sorties        Nuc-weapons
```

Type-arena-force

Forces other than ground forces counted for alternate theaters.

```
Airlift                      Sealift
Chemical                     Truck
Patrol-craft-A               UCW
Patrol-craft-B
```

Type-attack-target-priority

Guidance to the Referee Air Commander model. See also the Air-commander-guidance order.

```
Air                          Naval
Ground-net                   Logistics
Political                    Other
Equal                        None
```

Type-authorization (Blue)

The authorizations that can be given a command. Not all authorizations are valid for each command. See also the AWP input Authorization.

```
Alert                        Nuclear
Biological                   Chemical
Combat                       Deep-attack
Deployment                   Dispersal
Jamming                      Poise
Special-operation            Termination
Open-ocean-ASW               UCW
USSR-target                  Bastion-target
Reserve-commitment           Launch-satellite
Move-satellite               Disperse-leadership
Evacuate-cities              Respond-in-kind
Airborne-alert               Preempt-air
Sanctuary                    Release
Combat-initiation            Delegation
Preemptive-air               Mobilization
```

Type-authorization (Red)

The authorizations that can be given a command. Not all authorizations are valid for each command. See also the AWP input Authorization.

```
Alert                        Nuclear
Biological                   Chemical
Combat                       Deep-attack
Deployment                   Dispersal
Jamming                      Poise
Special-operation            Termination
US-target                    Blue-engagement
Reserve-commitment           Mobilization
Launch-satellite             Move-satellite
Disperse-leadership          Evacuate-cities
Respond-in-kind              Airborne-alert
Sanctuary                    Release
Combat-initiation            Delegation
SNA-strike
```

Type-authorization-level (Blue)

The levels that can be set for the authorizations in Type-authorization. Most levels are valid for only one authorization. See also the AWP input Authorization.

```
NA
None
200000-mob              Full-mob              Demobilize
Conventional            Chemical              Nuclear
Honored                 Hot-pursuit           Occasional
Max-relative            Max-readiness         ASAP
Demo-nuc                Limited-nuc           Massive-nuc
Nominal                 Limited               Full
```

Type-authorization-level (Red)

The levels that can be set for the authorizations in Type-authorization. Most levels are valid for only one authorization. See also the AWP input Authorization.

```
NA
None
Increased-alert         Threat-of-war-alert
Full-combat-alert       Withhold-alert
Full-mob                Demobilize
Conventional            Chemical Nuclear
Honored                 Hot-pursuit           Occasional
Max-relative            Max-readiness         ASAP
Limited-nuc             Massive-nuc
Nominal
Limited
Full
```

Type-AWP (Blue)

Individual AWP names. The 0 suffix is used for peacetime plans, which do little other than report bound violations up the chain of command. The X suffix denotes stub plans available for use as interpreted plans with corresponding functions already declared in the AWP Dict directory. The RAND-ABEL plan names appear in all capital letters; corresponding file names are all lower case.

```
JCS0            JCS1            JCSX
EUR0            EUR1            EURX
SAC0            SAC1            SACX
AFNORTH0        AFNORTH1        AFNORTHX
AFCENT0         AFCENT1         AFCENT2         AFCENT3         AFCENT4
                AFCENTX
AFSOUTH0        AFSOUTH1        AFSOUTH2        AFSOUTHX
CENT0           CENT1           CENT2           CENTX
LANT0           LANT1           LANTX
```

```
PAC0          PAC1          PACX
KOREA0        KOREA1        KOREAX
Any
```

Type-AWP (Red)

Individual AWP names. X-plans are stubs available for use as interpreted plans.

```
SHC0          SHC1          SHCX
SNF0          SNF1          SNFX
NWCOM0        NWCOM1        NWCOMX
HCFW0         HCFW1         HCFW2         HCFW3         HCFW4         HCFW5
              HCFW6         HCFW7         HCFW8         HCFW9         HCFW10
              HCFWX
HCFSW0        HCFSW1        HCFSW2        HCFSWX
HCFS0         HCFS1         HCFS2         HCFSX
HCFFE0        HCFFE1        HCFFEX
DPRK0         DPRK1         DPRKX
Any
```

Type-AWP-move (Blue)

Used by AWPs to mark moves done that are only to be done once.

```
Bahrain-deploy                  Belgium-deploy
Canada-deploy                   Denmark-deploy
France-deploy                   FRG-deploy
Greece-deploy                   Iran-deploy
Italy-deploy                    Kuwait-deploy
Nether-deploy                   N-Yemen-deploy
Norway-deploy                   Oman-deploy
Pakistan-deploy                 Portugal-deploy
Qatar deploy                    Saudi-Arabia-deploy
S-Korea-deploy                  S-Yemen-deploy
Spain-deploy                    Turkey-deploy
UAE-deploy                      US-deploy
UK-deploy

UK-cover                        Belgium-cover
Nether-cover

Assured-destruction-nuclear     Banak-evac
Battlefield-nuclear             CENTAG-fallback
CVBG-to-E-Med                   Commit-GE-10th
Commit-GE-7th                   Demo-nuc-use
Early-reinforce                 Ems-neck-barrier
Finn-Wedge-air-def              IGB-barrier
Invalo-border-air-def           Invalo-border-gnd-def
JCS-deploy                      Massive-military-nuclear
NORTHAG-fallback                Preemptive-air-strike
Rebase                          Rhine-barrier
Support-Austria                 Support-Norway
Theater-nuclear                 Weslek-barrier
```

Type-AWP-move (Red)

Used by AWPs to mark moves done that are only to be done once.

```
Bulgaria-deploy                 Czech-deploy
GDR-deploy                      Hungary-deploy
N-Korea-deploy                  Poland-deploy
USSR-deploy

Adjust-attack                   Air-assault
Ally-missing                    Amphib-assault
Atk-Erzurum                     Atk-Sarikamis
Battlefield-nuclear             Commit-13th-Army
Commit-2nd-GA                   Commit-5th-GTA
Commit-7th-TA                   Commit-CGF
Commit-GDR-III-MD               Commit-reserves
Depth-of-front-nuclear          Generation
Poles-deploy-to-axis-2          Rebase
Set-D-Day
```

Type-axis-mission

Missions that can be given to a main theater axis. See also the Axis- mission-order.

```
Withdraw                        Delay
Defend                          Defend-delay
Defend-withdraw                 Pin-attack
Support-attack                  Main-attack
Cancel
```

Type-axis-position

Positions ground forces that can take on an alternate theater LOC axis.

```
On-FLOT
Assembly
All
```

Type-axis-tactic

Tactics that can be given an alternate theater LOC axis. See also the Axis-tactic-order.

```
Defend                          Delay
Attack                          Pin
```

Type-axis-thrust

Levels of effort that can be assigned to main theater axes. See also the Axis-thrust-order.

```
Main-effort
High-priority
Low-priority
```

Type-bound (Blue)

Requirements that can be set for AWPs to report the condition occurance to its superior plan. See also the section AWP Inputs, Bounds.

```
Enemy-mobilizing
Enemy-dispersing
Enemy-poising
Evacuating-cities
Side-switching
Enemy-escalation
Combat-occuring
Chemical-weapons-use
Nuclear-weapon-use
Breakthrough-achieved
De-facto-cease-fire
Enemy-breakthrough
FLOT-location
Insufficient-force-ratio
Excessive-naval-attrition
Insufficient-reserves
Enemy-deploying
Enemy-generating
Ultimatum-received
Strategic-forces-dispersed
Alliance-incohesion
Enemy-jamming
Blue-engaged
Biological-weapon-use
Berlin-blockade
Cease-fire-offered
Redline-crossed
Advance-halted
FLOT-velocity
Excessive-troops-attrition
Excessive-air-attrition
```

Type-bound (Red)

Requirements that can be set for AWPs to report the condition occurance to its superior plan. See also the section AWP Inputs, Bounds.

```
Enemy-mobilizing
Enemy-dispersing
Enemy-poising
Evacuating-cities
Side-switching
Enemy-escalation
Combat-occuring
Biological-weapon-use
Berlin-blockade-broken
Breakthrough-achieved
De-facto-cease-fire
Enemy-breakthrough
FLOT-location
Insufficient-force-ratio
Excessive-naval-attrition
Enemy-deploying
Enemy-generating
Ultimatum-received
Strategic-forces-dispersed
Alliance-incohesion
Enemy-jamming
Chemical-weapons-use
Nuclear-weapon-use
Blue-presence-in-Iran
Cease-fire-offered
Redline-crossed
Advance-halted
FLOT-velocity
Excessive-troops-attrition
Excessive-air-attrition
```

```
Insufficient-reserves
```

Type-combat-tempo

Tempo can be continual, Blitzkrieg, or single spasm strike.

```
Protracted  [ Continual and protracted ]
Blitz       [ Blitzkrieg ]
Spasm       [ Single, spasm strike ]
```

Type-command (Blue)

The commands making up the Blue Agent. Each AWP is associated with one of these commands.

```
NCA                    JCS
EUR                    SAC
SPACE                  FORCECOM
NORAD                  LANT
AFNORTH                AFCENT
AFSOUTH                CENT
SOUTH                  PAC
KOREA
All
```

Type-command (Red)

The commands making up the Red Agent. Each AWP is associated with one of these commands.

```
DEFC                   SHC
HCFR                   SNF
NWCOM                  HCFW
HCFSW                  HCFS
HCFFE                  DPRK
All
```

Type-command-aggregation

The measures of forces that are aggregated by arena (such as CEUR) and command (such as AFCENT). See also the Ask-force-command-data query.

```
Avg-FLOT-location      Avg-FLOT-rate
Deepest-penetration    Land-attrition
Air-attrition          Tnuc-attrition
Divisions              Total-EDs
Total-FLOT-EEDs        Conv-COF
Tacair-sorties         Fighter-sorties
Multi-air-air-sorties  Cas-sorties
Interdictor-sorties    M-bomber-sorties
Multi-air-gnd-sorties  Nuc-weapons
```

Type-conflict-level

The level of conflict in a region. See also the Ask-force-regional- conflict-level query.

```
Termination                    Peace
Crisis                         Nonsuperpower-conflict
Superpower-intervention        Demo-conv
Regional-nuclear               Gen-conv
Demo-tac-nuc                   Gen-tac-nuc
Demo-strat-nuc                 CF-strat-nuc
Gen-strat-nuc
```

Type-cooperation

Notes to what extent a Green Agent country is aiding its superpower ally. See also the communication Cable and the Cooperate-order.

```
Uncooperative                  Normal
Transit                        Combat-basing
Nuclear-release
```

Type-country

The countries represented in the RSAS.

```
Afghanistan        Ecuador          Kuwait           Saudi-Arabia
Albania            Egypt            Laos             Somalia
Algeria            El-Salvador      Lebanon          South-Africa
Argentina          Etniopia         Libya            South-Korea
Australia          FRG              Malaysia         South-Yemen
Austria            Finland          Mexico           Spain
Bahrain            France           Mongolia         Sri-Lanka
Bangladesh         GDR              Morocco          Sudan
Belgium            Greece           Netherlands      Sweden
Belize             Guatemala        Nicaragua        Switzerland
Bolivia            Guyana           North-Korea      Syria
Brazil             Haiti            North-Yemen      Taiwan
Bulgaria           Honduras         Norway           Thailand
Burma              Hungary          Oman             Tunisia
Cambodia           Iceland          Pakistan         Turkey
Canada             India            Panama           UAE
Chile              Indonesia        Paraguay         UK
Colombia           Iran             Peru             US
Costa-Rica         Iraq             Philippines      USSR
Cuba               Ireland          Poland           Uruguay
Czechoslovakia     Israel           Portugal         Verezuela
Denmark            Italy            PRC              Vietnam
Djibouti           Japan            Qatar            Yugoslavia
Dominican-         Jordan           Romania          all
  Republic
```

Type-country-aggregation

The measures of forces that are aggregated by country. See also the Ask-force-country-data query.

```
Ammo-prod-damage
Ammo-storage-damage
Arms-prod-damage
Arms-storage-damage
Attack-sub-damage
Attack-subs
Carrier-damage
Carriers
Com-control-damage
Combat-afld-damage
Commo-damage
Conv-COF
Deployed-EDs
Ground-base-damage
Missile-silo-damage
Mobilized-EDs
Nuc-power-gen-damage
Nuc-prod-damage
Other-prod-damage
Other-surface
Other-surface-damage
Poised-EDs
POL-prod-damage
POL-storage-damage
Seaport-damage
SSBN-damage
SSBNs
Total-EDs
Transiting-Attack-subs
Transiting-Carriers
Transiting-other-damage
Transiting-Other-surface
Transiting-SSBNs
```

Type-deception-strategy

Deception strategy for a command.

```
Cover
Decoy
```

Type-DEFCON (Blue)

Blue Defense Condition levels. See also the AWP input DEFCON.

```
DEFCON-5
DEFCON-2
DEFCON-4
DEFCON-1
DEFCON-3
```

Type-defense-level

The level of defenses in a main theater zone. See also the Build-defense-order.

```
Prepared
Fortified
```

Type-delegated-authority

Level of NCL delegation of authority to the GCL.

```
Full
Nominal
Limited
```

Type-delegation-condition

Conditions for the use of delegated authority. Tac-warn through Rideout-delayed refer to SAC only.

```
Upon-attack                    Assessment
Upon-need                      Confined
Strat-warn                     Rideout-prompt
Tac-war                        Rideout-delayed
```

Type-delegation-withhold

Circumstances under which NCL delegation of authority to the GCL is withheld.

```
Immediate
Upon-event
Time-limited
```

Type-forces-controlled

Types of forces over which NCL control is delegated to commands.

```
Recce-intel                    Ground-and-air
JCW                            ICBM
Combat-RPV                     NATO-SLBM
Naval                          Strat-nuc-forces
Tacair
```

Type-frequency

See the Jamming-order.

```
VLF                            LF
MF                             HF
UHF
```

Type-general-target-withhold (Blue)

Target withholds organized by country or alliance status.

```
Allies                         Czech
Neutrals                       Romania
```

```
Noncombat                    Hungary
Poland                       Yugoslavia
```

Type-general-target-withhold (Red)

Target withholds organized by country or alliance status.

```
Allies                       UK
Neutrals                     Netherlands
Noncombat                    Belgium
France                       Greece
```

Type-global-authorization (Blue)

The authorizations for global action. See also the AWP input Global-authorization.

```
Mership-requisition
CRAF
NATO-alert
```

Type-global-authorization-level (Blue)

The levels set for the authorizations in Type-global-authorization. See also the AWP input Global-authorization. Withhold-alert means stood-down.

```
Full                         None
III                          II
Simple-alert                 Reinforced-alert
General-alert                Withhold-alert
```

Type-gnd-force-mission

The missions that can be given a ground force. See also the Gnd-force-mission-order.

```
Air-drop                     Air-assault
Cancel                       Dig-in
OMG
```

Type-ground-strategy (Blue)

Ground strategy for a command.

```
Forward
Fallback
Prompt-nuc
```

Type-ground-strategy (Red)

Ground strategy for a command.

```
Isolate-US
Northern-focus
Multi-front
```

Type-ground-support-priority

Guidance to the Referee Air Commander model. See also the Air-commander-guidance order.

```
Priority                Weighted
Equal                   None
```

Type-high-low

```
Value
High
Low
```

Type-hotline-channel

The two channels available for messages between Red and Blue Agents. See also the communication Hotline.

```
Blue-to-Red
Red-to-Blue
```

Type-hotline-penalty

The penalties promised as part of a message between Red and Blue Agents See also the communication Hotline.

```
Superpower-intervention          Regional-demo-conv
Eur-demo-conv                    IC-demo-conv
Regional-gen-conv                Regional-nuclear
Eur-gen-conv                     IC-gen-conv
Eur-demo-tac-nuc                 Eur-gen-tac-nuc
Eur-demo-strat                   Eur-CF-strat
Eur-gen-strat                    IC-CF-nuc
IC-gen-nuc
```

Type-hotline-request

The requests made as part of a message between Red and Blue Agents. See also the communication Hotline.

```
Do-not-escalate                 Cease-fire
Withdraw-from-my-territory      Withdraw-to-your-territory
Surrender
```

Type-hotline-reward

The rewards promised as part of a message between Red and Blue Agents. See also the communication Hotline.

```
Will-not-escalate               Cease-fire
Withdraw-from-your-territory    Withdraw-to-my-territory
Surrender
```

Type-insertion

The type of lift used for an operation in an alternate theater. See also the Operation-order.

```
In-place                        Heliborne
Sea                             Air
SSM
```

Type-involvement

Defines a Green Agent country's level of involvement in each theater. See also communication Cable.

```
Disengaged                      Normal
Partial-alert                   Full-alert
Mobilized                       On-call
In-combat                       Nuc-combat
```

Type-launch-method

See the Launch-order.

```
Flush
Sustain
```

Type-level

See the Sabotage-order.

```
Slight                          Partial
Major                           Total
```

Type-military-involvement

The level of military involvement by a side in a region. See also the involvement queries.

```
Termination                    None
Preparation                    Demo-conv
Gen-conv                       Demo-tac-nuc
Tac-nuc                        Demo-strat-nuc
CF-strat-nuc                   Strat-nuc
```

Type-missing-ally (Blue)

Used by AFCENT AWPs to mark allies that are late granting control.

```
None                           Belgium
France                         Netherlands
UK                             Too-many
```

Type-missing-ally (Red)

Used by HCFW AWPs to mark allies that are late granting control.

```
None                           Too-many
GDR                            Poland
Czech
```

Type-mob-duration

Desired duration of mobilization for a command.

```
Short
Best
Long
```

Type-naval-speed

Naval taskgroup deployment speeds. See also the Deploy-naval-order.

```
Taskforce
Max-taskforce
Flankspeed
```

Type-naval-strategy (Blue)

Naval strategy for a naval command.

```
Forward
```

Type-naval-strategy (Red)

Naval strategy for a command.

```
Forward
Interdict
Bastion
Shoot-first
```

Type-OCL

The main theater Operational Command Level models. See also the OCL-on-off-order.

```
Air
Ground
```

Type-on-off

A binary variable.

```
On
Off
```

Type-operation

The operations ordered in an alternate arena. See also the Operation-order.

```
UCW
Chemical
Nuclear
Regular
```

Type-operation-mission

The missions given to alternate theater point axes specifiying the tactics of the forces there. See also the Axis-mission-order and Operation-order.

```
Denial
Occupy
Disperse
```

Type-operational-objective (Red)

Objectives for a command. Only part of the entire list is applicable to each command.

```
[ SHC ]
Destroy-US
Defeat-Blue-worldwide
Defeat-NATO
Defend-alliances
Limit-coalition-losses
Limit-USSR-losses
Support-allies
[ SNF ]
Destroy-Blue
Destroy-military
Destroy-nuc-threat
Destroy-projection
Destroy-theater-nuc
Deter
[ HCFW ]
Occupy-CEur
Occupy-FRGD-BENELUX
Occupy-FRG-Denmark
Occupy-FRG
Hold
Restore
[ NWCOM ]
Occupy-Norway-Sweden
Occupy-Norway
Occupy-north-Norway
Deny-Norway
[ HCFSW ]
Occupy-Greece-Turkey
Control-Strait-EMed
Control-Strait
Deny-EMed
Limit-losses
[ HCFFE ]
Support-DPRK
[ HCFS ]
Occupy-Arabia
Occupy-Iran
Occupy-ETurkey
Deny-resources
```

Type-overlay

The axes and points that make up the military geography of the main and alternate theaters. CEUR, WTVD, FEAST, and FETVD are main theaters and have reserve areas and numbered axes. The alternate theaters have LOC axes and geographically named point axes. Only axes for CEUR/WTVD and AG-Italy/Fr-Italy are shown as examples.

```
CEUR-1                  CEUR-2                  CEUR-3
CEUR-4                  CEUR-5                  CEUR-6
CEUR-7                  CEUR-8                  CEUR-9
CEUR-10
CEUR-A-res              CEUR-B-res              CEUR-C-res
CEUR-res

WTVD-1                  WTVD-2                  WTVD-3
WTVD-4                  WTVD-5                  WTVD-6
WTVD-7                  WTVD-8                  WTVD-9
WTVD-10
WTVD-A-res              WTVD-B-res              WTVD-C-res
WTVD-D-res
WTVD-res
```

Type-overlay-aggregation

The measures of forces that are aggregated by overlay (e.g., axis CEUR-1). See also the Ask-force-overlay-data query. EEDs are effective equivalent divisions.

```
FLOT-location                   FLOT-rate
```

```
Divisions                    Avg-pct
Total-EDs                    Combat-EEDs
FLOT-EEDs                    Land-attrition
Air-attrition                Tnuc-attrition
Conv-COF                     Ground-goal
```

Type-permit-deny

See the Cooperate-order and Restrict-combat-order.

```
Permit
Deny
```

Type-plan-point (Blue)

The possible phases and transitions between phases in all AWPs.

```
Top-of-plan                  Move-to-deterrence
Deterrence                   Move-to-defense
Defense                      Move-to-counterattack
Counterattack                Move-to-nuclear
Nuclear                      Move-to-post-nuclear
Post-nuclear                 Move-to-termination
Termination
```

Type-plan-point (Red)

The possible phases and transitions between phases in all AWPs.

```
Top-of-plan                  Move-to-preparation
Preparation                  Move-to-conventional
Conventional                 Move-to-initial-assault
Initial-assault              Move-to-defensive-pause
Defensive-pause              Move-to-deliberate-assault
Deliberate-assault           Move-to-prepared-assault
Prepared-assault             Move-to-planned-assault
Planned-assault              Move-to-adjusted-assault
Adjusted-assault             Move-to-nuclear
Nuclear                      Move-to-post-nuclear
Post-nuclear                 Move-to-termination
Termination
```

Type-pt-axis-target

The possible targets at an alternate theater point.

```
Capital                      Seaport
Airfield                     Keypoint
Stockpile                    Landchoke
Road
all
```

Type-reason (Blue)

The reasons that a Blue AWP may use in a report to its superior plan. See also the communication Notify-higher-authority.

```
under-attack                    under-nuclear-attack
attack-in-secondary-arena       campaign-limit-expired
mobilization-limit-expired      time-limit-expired
no-appropriate-guidance         termination-in-theater
ready-to-attack                 plan-completed
insufficient-EMT                insufficient-forces
surviving-enemy-capability      unfavorable-exchange-ratio
receipt-of-cable                approaching-endurance-limits
loss-of-political-control       minimal-reserve-force
lookahead-evaluation            EW-ineffective
launch-impossible               BENELUX-noninvolvement
French-noninvolvement           losing-war
cable-request                   discrepancy-report
nuc-defense-requested           naval-losses-of-30%
carrier-loss                    action-request
red-poise                       inability-to-defend
2nd-ech-commit                  deteriorating-situation
alliance-incohesion
```

Type-reason (Red)

The reasons that a Red AWP may use in a report to its superior plan. See also the communication Notify-higher-authority.

```
under-attack                    under-nuclear-attack
campaign-limit-expired          time-limit-expired
phaseline-not-reached           envelopment-not-possible
no-appropriate-guidance         termination-in-theater
ready-to-attack                 plan-completed
objective-met                   insufficient-EMT
insufficient-forces             surviving-enemy-capability
unfavorable-exchange-ratio      receipt-of-cable
approaching-endurance-limits    loss-of-political-control
minimal-reserve-force           lookahead-evaluation
EW-ineffective                  launch-impossible
Blue-tripwire-impeding-progress discrepancy-report
action-request                  reached-france
suspending-attack               setting-D-Day
alliance-incohesion
```

Type-recommendation (Blue)

The recommendations that a Blue AWP may use in a report to its superior plan. See also the communication Notify-higher-authority.

```
no-recommendation               change-plan
```

```
awaiting-guidance                    extend-deadline
accept-plan                          objective-met
objective-unmet                      terminate-plan
reinforce-main-axes                  reinforce-command
reject-plan                          change-to-fallback-defense
NATO-ally-on-call                    revise-expected-D-Day
evacuate-cities-authorization        CRAF-authorization
mership-requisition-authorization    dispersal-authorization
combat-authorization                 nuclear-authorization
termination-authorization            consider-nuclear-use
augment-air                          unable-to-defend
```

Type-recommendation (Red)

The recommendations that a Red AWP may use in a report to its superior plan. See also the communication Notify-higher-authority.

```
no-recommendation                    change-plan
awaiting-guidance                    extend-deadline
accept-plan                          objective-met
objective-unmet                      terminate-plan
reinforce-main-axes                  reject-plan
combat-authorization                 nuclear-authorization
termination-authorization
```

Type-region

The geographic (as opposed to political) regions modelled by the RSAS.

```
Canada-E          Canada-W

Alaska            Hawaii            US-NCen           US-NE
US-NPlains        US-SCen           US-SE             US-W

Belize            Costa-Rica        Cuba              Dominican-
                                                      Republic
El-Salvador       Guatemala         Haiti             Honduras
Mexico            Nicaragua         Panama            Puerto-Rico

Argentina         Bolivia           Brazil            Chile
Colombia          Ecuador           French-Guiana     Guyana
Paraguay          Peru              Surinam           Uruguay
Venezuela

USSR-Cen-Asia     USSR-Far-East     USSR-Leningrad    USSR-Moscow
USSR-Siberia      USSR-SW           USSR-Urals        USSR-W
USSR-Kamchatka    USSR-Kurils
Albania           Bulgaria          Czechoslovakia    GDR
Hungary           Poland            Romania           Yugoslavia-N
Yugoslavia-S

Austria           Azores            Belgium           Denmark           Zealand
```

Finland	France[2]	Toulon[3]	FRG	Greece
Greenland	Iceland	Ireland	Italy	
Netherlands	Norway-N	Norway-S	Portugal	Spain
Sweden-N	Sweden-S	Switzerland	UK	West-Berlin
Israel	Jordan	Lebanon	Syria	
Turkey-E	Turkey-W	Afghanistan	Bahrain	
Iran	Iraq	Kuwait	Oman	
North-Yemen	Pakistan	Qatar	Saudi-Arabia-E	
Saudi-Arabia-W	South-Yemen	UAE		
Bangladesh	Burma	Cambodia	Diego-Garcia	
India	Indonesia	Japan[4]	Hokkaido	
Okinawa	Laos			
Malaysia	Mongolia	North-Korea	PRC-NE	
PRC-SE	PRC-W	South-Korea	Sri-Lanka	
Taiwan	Thailand	Vietnam		
Algeria	Central-Africa	Djibouti	East-Africa	
Egypt	Ethiopia	Libya	Morocco	
Sahel	Somalia	South-Africa	Sudan	
Tunisia	West-Africa	Australia		
New-Zealand	Guam	Philippines		
Arctic-A	Arctic-P	Barents	Norwegian-Sea	
W-Atlantic	Mid-Atlantic	E-Atlantic	Gulf-of-Mexico	
Caribbean	Eq-Atlantic	S-Atlantic	Baltic	
North-Sea	W-Mediter	Mid-Mediter	E-Mediter	
Black-Sea	Persian-Gulf	Red-Sea	Arabian-Sea	
Indian-East	Indian-West	S-China-Sea	Japan-Sea	
Okhotsk-Sea	Bering	NW-Pacific	NCen-Pacific	
NE-Pacific	SE-Pacific	SW-Pacific	Labrador-Sea	
GI-Gap	IUK-Gap	IN-Gap	UKN-Gap	
English-Channel	Skagerrak-St	Florida-St	Canal-Zone	
Horn-Passage	Hope-Passage	Gibraltar-St	Turkish-St	
Suez-Canal	Babmandb	Oman-Gulf	Hormuz-St	
Sunda-St	Malacca-St	Sicilian-St	Kuril-St	
Makassar-St	Korea-St	Svalbard-St	Philippine-Sea	
NW-Pac-Basin	Sidra-Gulf	Yellow-Sea	Hudson-Bay	
White-Sea	PTG-Bay[5]	ESE-Pacific	ENE-Pacific	
La-Perouse-St	Tsugaru-St	Aegean Sea	E-China-Sea	

all

Type-region-aggregation

The measures of forces that are aggregated by region. See also the Ask-force-region-data query.

---

[2]Does not include the Mediterranean coast.

[3]The Mediterranean coast of France.

[4]Does not include Hokkaido.

[5]Peter the Great Bay.

```
Total-EDs                       Mobilized-EDs
Deployed-EDs                    Poised-EDs
Conv-COF

Combat-afld-damage              Other-afld-damage
Missile-silo-damage             Naval-base-damage
Seaport-damage                  Com-control-damage
Commo-damage                    Nuc-power-gen-damage
Ground-base-damage              Nuc-prod-damage
Nuc-storage-damage              Ammo-prod-damage
Ammo-storage-damage             Arms-prod-damage
Arms-storage-damage             POL-prod-damage
POL-storage-damage              Other-prod-damage

Carriers                        Other-surface
Attack-subs                     SSBNs
Carrier-damage                  Other-surface-damage
Attack-sub-damage               SSBN-damage
Transiting-Carriers             Transiting-Other-surface
Transiting-Attack-subs          Transiting-SSBNs
```

Type-right

See the Cooperate-order.

```
Overfly                         Basing
Transit                         Nuclear
```

Type-ROE

The rules of engagement set in sea regions. See also the Engage-order.

```
Withdraw                        Defend
Trail                           Exclude
Attack
```

Type-sea-control

Who controls the sea regions and choke points. See also the Ask-force-sea-control query.

```
Red                             Contest
Blue                            Unknown
```

Type-season

The variable Season is set to the season appropriate to the northern hemisphere.

Spring
Summer
Winter
Fall

Type-self-defense

Rules of engagement for self-defense by command.

Engage-if-able
Engage-if-provoked
Engage-hostile-only
Limit-self-defense
Report-only

Type-ship-task

The tasks that can be given to naval forces. See also the Task-order.

ASW-area
Amphib-support
SLOC-attack
Strike
ASW-barrier
Mine
SLOC-defense
Strategic

Type-sland-mission

The combat missions for aircraft in alternate theaters. See also the Air-apportionment-order.

CAS
BAI
Attack
Escort
DCA

Type-special-action-authorization

Directed Authorized Prohibited

Type-strategic-aggregation

The strategic measures that are aggregated for each superpower. See also the Ask-force-strategic-data query.

1st-strike-capability
2nd-strike-capability
Air-defense-attrition
Alerted-H-bombers
Alerted-ICBMs
Alerted-SLBMs
Ammo-prod-damage
Ammo-storage-damage
Arms-prod-damage
Arms-storage-damage
Available-warheads
Launched-ICBM-warheads
Launched-ICBMs
Launched-SLBM-warheads
Launched-SLBMs
Launched-bomber-warheads
Lost-H-bombers
Lost-ICBMs
Lost-SLBMs
Missile-silo-damage
Naval-base-damage
Nuc-power-gen-damage

```
Com-control-damage
Combat-afld-damage
Commo-damage
Damaged-warheads
EMT
Exchange-ratio
Executed-H-bombers
Executed-ICBMs
Executed-SLBMs
Ground-base-damage
LUA-capability
Launched-H-bombers
Nuc-prod-damage
Nuc-storage-damage
Operational-H-bombers
Operational-ICBMs
Operational-SLBMs
Other-afld-damage
Other-prod-damage
POL-prod-damage
POL-storage-damage
Seaport-damage
Total-warheads
Used-warheads
```

Type-target-withhold (Blue)

Specific target withholds.

```
Urban-occupied
Urban-NSWP
Urban-Soviet
Leadership
Attack-assessment
Sov-Eur-forces
Sov-regional-forces
```

Type-target-withhold (Red)

Specific target withholds.

```
Urban-NATO
Urban-US
Leadership
Attack-assessment
US-Eur-forces
US-regional-forces
```

Type-targeting-strategy

Strategic weapon targeting strategy for SAC/SNF.

```
CF
CP
CM
CMV
CMVC
```

Type-termination-strategy (Blue)

Termination strategy for a command.

```
Seek-surrender
Tradeoff
Cease-fire
Surrender
```

Type-termination-strategy (Red)

Termination strategy for a command.

```
Seek-surrender
Tradeoff
Cease-fire
Surrender
```

Type-theater

Geographic theaters used by the National Command Level.

```
IC                          Central-Europe
Northern-Europe             Southern-Europe
Southwest-Asia              Middle-East
Far-East                    Pacific
Atlantic                    Other-land
Other-naval
```

Type-theater-aggregation

The measures of forces that are aggregated by theater. See also the Ask-force-theater-data query.

```
Air-attrition               Military-damage
Available-warheads          Mobilized-EDs
Avg-FLOT-location           Nuc-COF
Avg-FLOT-rate               Nuc-weapons
Conv-COF                    Other-damage
Damaged-warheads            Poised-EDs
Deepest-penetration         Strategic-damage
Deployed-EDs                Tnuc-attrition
Divisions                   Total-EDs
EMT                         Total-warheads
Land-attrition              Used-warheads

Attack-sub-damage           Other-surface
Attack-subs                 Other-surface-damage
Carrier-damage              SSBN-damage
Carriers                    SSBNs
```

Type-theater-priority

```
Primary
Secondary
```

Type-unit

```
all

Troops                      Armor
TKD                         Mech
MRD                         Infantry
Airborne                    Airmobile
Aircav                      Arty
Marine                      Amphib
MPS                         POMCUS
```

Air	Tacair
Fighter	Defender
CAS	Multi
Fbomber	Interdictor
Mbomber	Hbomber
Tanker	Reccon
AWACS	ECM
MPA	C3
NEACP	PACCS
Surface	Carrier
Battleship	Cruiser
Destroyer	Frigate
Small-cbt	Support
Submarine	SSBN
Attack-sub	
Lift	Airlift
Sealift	UESealift
CargoSealift	
ICBM	
Nuclear	IRBM
MIRBM	MRBM
SRBM	GLCM
VSRBM	Nucarty
Civil	Leadership

Type-warhead

Conv	Conventional
Chem	Chemical
Nuc	Nuclear
None	

Type-weapons-level

Queries may concern forces or regions associated with a specific level of weapons use.

Peace	Limited
Conventional	Chemical
Nuclear	all

Type-weapon-status

Queries may be limited to forces achieving a particular status.

Normal	Mobilized
Alerted	Deployed
Poised	Launched
Executed	all

Type-weighting

Weighting scheme for the Ask-force-count query.

```
normal#
sorties#
attrition#
```

Type-what-to-count

The classes of strategic weapons that can be counted through queries.

```
Available                    Total
Damaged                      Used
```

Type-3-range

```
Low
Med
High
```

Type-#-%

Used in orders to indicate whether the quantity of forces is an absolute number or a percentage of applicable forces.

```
#
%
```

Appendix
ELEMENTS OF THE RAND-ABEL LANGUAGE

The intent in developing RAND-ABEL was for it to be readable and understandable by people who have substantive domain knowledge (such as knowledge of military strategy), but who need not be computer programmers. Other languages, such as RAND's ROSIE, are also highly readable, but RAND-ABEL executes faster. Though easy to read, good RAND-ABEL code for the RSAS is not especially easy to write because it has features such as strong typing and because the RSAS has a complex control structure. In practice, many RSAS users function quite well by copying existing RAND-ABEL rules (code) and modifying them, rather than writing new RAND-ABEL from scratch. The modifications can be quite extensive so long as basic control structure is unchanged.[1]

Names

RAND-ABEL names of functions, variables, and enumerations must not contain embedded blanks; hyphens are used in place of blanks. The underscore (_), while legal in RAND-ABEL names, should not be used, to avoid difficulties in the Data Editor. Those CAMPAIGN functions written in C, rather than in RAND-ABEL, make extensive use of the underscore rather than the hyphen; this is one way, generally, to distinguish between names used by RAND-ABEL and C. By convention, names that are used in more than one function begin with a capital letter and are called "global," and names used in only one function begin with a lower case letter and are called "local."

Declarations

To establish the name of a function or variable, it must be declared. Declaration statements for global names make up the Data Dictionary and are collected in files ending with the extension ".D" in directories named "Dict." Documentation on the use of these names is also found in these files.[2]

---

[1]For a fuller discussion of RAND-ABEL, see N. Z. Shapiro, E.H. Hall, R. H. Anderson, M. LaCasse, M.S. Gillogly, and R. Weissler, *The RAND-ABEL Programming Language: Reference Manual*, RAND, N-2367-1-NA, December 1988. See also Paul Davis's RAND-ABEL primer for analysts, cited in the Bibliography.

[2]Data Dictionary declarations may also be examined by use of the Cross Reference Tool, accessed from the Control Panel of the RSAS. Given the name of a global variable or function, this tool can give the declaration, accompanying description, file where declared, and files where

Local names are declared at the top of the function in which they are used.

The Declare Statement is of the form:

```
Declare this-function:  Perform this-function.
Declare this-variable:  Let this-variable be 1.0.
Declare that-variable:  Let  that-variable of Type-country be 1.0.
```

The use of "Perform" in the above example identifies this-function as a function. The use of "Let" in the second example identifies this-variable as a variable, and the "1.0" declares that the values of this-variable are floating point numbers. The use of "of country" declares that-variable as an array variable. Enumerations may also be used as array indexes.

Enumerations

In addition to simple data types such as integers, RAND-ABEL allows the definition of enumerated data types that are ordered lists of arbitrary words. By convention, all enumeration names begin with "Type-":

```
Define Type-warning:
  None
  Ambiguous
  Clear
```

Defined enumerated data types may be used in the declarations of functions and variables.

```
Declare Blue-warning:  Let Blue-warning be Type-warning.
```

The variable Blue-warning could then take on the values of the enumeration Type-warning.

Functions

All RAND-ABEL programs consist of functions. Every function begins with a Define statement and ends with an End statement:

```
Define This-function:
End.
```

---

referenced. Given a value from a global enumeration, it can give the enumeration name, other values, file where defined, and files where referenced.

Define statements must end with colons. End statements (and most other RAND-ABEL statements) end with periods.

Once declared and compiled, a function can be modified and interpreted, provided its name is not changed.

Ownership

Every global function, variable, and enumeration has an owner; in the RSAS, these are Blue, Red, Green, Control, Referee, and Global. The default owner is stated at the top of each file with the Owner statement:

```
Owner:  Blue.
```

Functions, variables, and enumerations may have the same name if they are of different owners. The Blue and Red Agents have many elements with the same names, since they are structured similarly. Names of one owner may be referenced in the code of another by prefacing the name with the possessive owner, as in "Red's Authorization." This is not necessary with names owned by Global.

Perform Statements

Functions that do not return values are executed (called) by means of the Perform statement. The Perform statement causes transfer of control to the named function. When that function completes executing, control is returned to the original function, and the next statement is executed.

In the example:

```
Define This-function:

    Perform That-function.
    Perform Another-function using Some-value as some-parameter.

End.
```

This-function calls functions That-function and Another-function. Here, Another-function is a function taking a parameter, some-parameter.

Statements between the Define and End statements are indented, to improve readability.

Let Statements

Let statements assign values to variables. In the following example:

```
Define This-function:

    Declare perceived-threat:  Let perceived-threat be Type-threat.

    Let Point-in-plan of AFCENT be Deploying.
    Let perceived-threat be Unspecified.

End.
```

A Let statement is used to assign value Deploying to the AFCENT element of the global variable Point-in-plan, and to assign value Unspecified (which is the default value for global variables) to the local variable perceived-threat.

Report Statements

Functions that return values are called by using the Report statement, as in the following example:

```
Define This-function:

    Declare perceived-threat:  Let perceived-threat be Type-threat.

    Let perceived-threat be the report from Recce using New-satellite
      as sensor.

End.
```

Comments

Nonexecutable comments in RAND-ABEL are enclosed by brackets. They may be on separate lines or may be included within executable statements.

```
[  This-function does nothing but call That-function  ]

Define This-function:

    [
        That-function is called by This-function
    ]

    Perform [that is, execute] That-function.
End.
```

If brackets appear on different lines, it helps readability to align them vertically, as shown above.

A special use of brackets is to put aside otherwise executable statements, so they can still be examined but will not be executed:

```
Define This-function:

    Perform That-function.
    [
        [  For Analytic Case B, unbracket the next statement  ]
    Perform Another-function.
    ]
End.
```

Such use of comments is called "commenting out" or "bracketing out" code.

Log Statements

Log statements write information into logs, which can be examined during or after an RSAS run. In many cases they are preferred to comments, in that they both document the code and record an audit trail during execution. There are three levels of logging, which can be specified by the RSAS user by agent or command: decisions-only, decisions-and-reasons, everything. The blank-separated list of items is written in the log file on a single line. A quoted string is written as given, while a variable name is replaced with its value. Examples of Log statements:

```
Define This-function:

    Log-decision "Deploying on day" Today.
    Log-reason   "  because of perceived threat",
    Log-note     "  this action should be repeated".

    Perform That-function.

End.
```

If this were executed when Today was game day 5 and log-level was set to decisions-and-reasons, the following entry would appear in the log:

```
Deploying on day 5
  because of perceived threat
```

Log statements are written for the human reader, not the computer. Accordingly, they should be concise but need not rigidly adhere to a standard syntax.

If-Then and If-Then-Else Statements

Conditional logic is expressed similarly to the way it appears in other languages. Conditional logic may be nested. An example:

```
Define This-function:

    Declare perceived-threat:  Let perceived-threat be Type-threat.

    If Today is at least 5
    Then Let Point-in-plan be Deploying.
    Else
    {
        Perform That-function.

        Let perceived-threat be the report from Recce
          using New-satellite as sensor.
        If perceived-threat > None
        Then Log-note "New satellite observed threat".
    }

End.
```

The braces delimit several statements conditional on the Else; indentation improves readability.

Decision Tables

A decision table is a tabular form of conditional logic. The following RAND-ABEL decision table

```
Decision Table
  Today  perceived-threat   /  action
  =====  ================   /  ================.
  >=5    --                    Deploy
  --     >None                 Deploy-faster
  --     --                    Do-nothing
```

is equivalent to the following If-Then-Else statement:

```
If Today >= 5
Then Let action be Deploy
Else If perceived-threat > None
Then Let action be Deploy-faster
Else Let action be Do-nothing.
```

The If part appears to the left of the slash, and the Then part is to the right. The double hyphens indicate indifference. Decision tables are executed row by row. When conditions match the values to the left of the slash, the action(s) to the right are executed, and the table is exited. It is good programming practice to end each decision table with a default action, to be executed if none of the rows above it execute.

The periods at the end of the row of equal signs and at the end of the last row are required. An alternative way of ending with a period is to use the following as a final row:

```
[End Table].
```

where End Table is commented out and only the period is executed.

For Statements

For statements iterate a block of statements for each of the values of an enumeration. The iterated enumeration is the data type of the index variable, given after the word For, which takes on the particular value of the enumeration in each iteration. The colon is required.

```
Define This-function:

     Declare each-country:  Let each-country be Type-country.

     For each-country:
     {
       Let Involvement of each-country be Eur-gen-conv.
     }
End.
```

Assuming that the enumeration Type-country had the values US, UK, Belgium, then this would be the equivalent of the statements:

```
     Let Involvement of US      be Eur-gen-conv.
     Let Involvement of UK      be Eur-gen-conv.
     Let Involvement of Belgium be Eur-gen-conv.
```

While Statements

While statements repeat a block of statements for as long as the conditions following the word While remain true. The colon is required.

```
Define This-function:

    Let Point-in-plan be Preparing:

    While Point-in-plan is Preparing:
    {
       Perform Sleep-until-tomorrow.
```

```
        If the report from Recce using New-satellite as sensor is High

        Then Let Point-in-plan be Deploying.
    }

End.
```

Other Tables

Tables other than decision tables do not have slashes. A common use of other tables is to represent orders, as in the following:

```
Table Position-order
  axis      kms
  =======   ===.
  WTVD-1     95
  WTVD-2    491    [Netherlands]
  WTVD-3    481
  WTVD-4    590    [Dunkirk]
  WTVD-5    521.   [Brussels]
```

which orders forces to advance toward specified positions on axes. Forms for more general tables are in the *RAND-ABEL Reference Manual.*

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